The Builder.

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THE design and arrangement of lunatic asylums have lately occupied the attention of many architects, and, indeed, will continue to do so, as several extensive buildings of this character are about to be erected in different parts of the country. The improved system of treating the insane which has been perfected in England, calls for a very different description of building from the structures formerly used as "mad-houses." Maddening houses they might truly have been termed; and their supervisors and keepers must have been more insane than many of the poor people who, in those times, were locked up in them, with few previous questions. The Asylum at Hanwell, under the management of the estimable Dr. Conolly, has established the great fact that kindness judiciously administered, and regularity enforced with firmness, will do what coercion, with all the aid of whips, strait waistcoats, leg-locks, muffs, straps, and chains, fails to effect. For some years past mechanical restraints have been wholly banished, and patients who are sometimes brought there manacled from prisons and parish receptacles, with the reputation of savage vindictiveness or unappeasable fury, are liberated, placed amongst a certain number of their fellows (properly classed), and a knife and fork put into their hands at dinner-time with perfect impunity.

A walk through this noble establishment, where a thousand patients of the two sexes, in all stages of madness, are congregated, removes the wonder which this fact may at first excite: all are so quiet and orderly, chains are so evidently not needed, that no credit seems due for avoiding the use of them. We forget how this has been brought about,—that it is the result of a system, to which let due honour be given.

The interior of Hanwell Asylum, with a fitting expositor, is a deeply interesting sight, though necessarily a sad one. The Bedlam of former times is now, we hope, simply a tradition.

For the perfection of such a system much depends on the nature of the building in which the patients are placed. In a gloomy, ill-arranged structure, without the means of perfect classification, nothing can be done. Bodily health and a cheerful tone of mind are most important for success, and to ensure these, as far as may be, good drainage and ventilation, light and airy chambers, and the most careful arrangement generally, are necessary. Everything repulsive or disheartening is to be avoided; a good situation, a cheerful aspect, and pleasant prospects are to be sought; and the means of general inspection by the directors, with the least fatigue and waste of time, the centralization of those offices and apartments which are used by the whole of the inhabitants of the building in common, protection of the patients from fire, and the most efficient and economical mode of heating the building, should be most carefully attended to.

Some persons are of opinion that a large asylum should be built on the villa principle, and resemble a little colony, the separate buildings being connected only by verandahs; whilst others of more experience, and who have resided in large establishments, state that such an arrangement would require nearly a double staff of officers to perform the duties. This seems evident; and when the extra expense in building, drainage, lighting with gas, and the extra number of boilers for warming, cisterns for the supply of water, and outlay for verandahs, together with other extra expenses which would be incurred in working such an establishment, are taken into consideration, we cannot venture to recommend such an arrangement.

Again: some few among those who take an interest in the cause of the insane recommend that the chapel of an asylum should be detached, and at some little distance from the main building. Those who entertain such an opinion, however, are not aware, perhaps, that the patients attend chapel, not on Sundays only, but twice a day throughout the winter as well as summer; and that to take feeble patients from the warm wards to the chapel, even though there be covered ways, would have a very prejudicial effect upon their health; besides, much needless expense would be incurred in the construction and working of a separate warming apparatus for the chapel alone, which would be avoided by having it conveniently situated in the asylum, and within reach of one of the boilers, from whence the heat for warming might be supplied when necessary.

The difficulties in arranging a lunatic asylum increase greatly when it is to accommodate more than five hundred patients. When it is for a thousand patients, as in the case of the additional pauper asylum for Middlesex, to be erected at Colney Hatch, to which we briefly alluded last week, there is a temptation to resort to a building *three stories* in height, which is very properly objected to by the Commissioners in Lunacy, and is decidedly to be avoided. The disadvantages of a third story are obvious, such as the additional fatigue occasioned by it, and the obstacle this affords to a proper supervision of it. Dr. Conolly, in a letter to the chairman of the Committee of Visitors, Benjamin Rotch, Esq., on the intended new asylum, which he published a short time ago, takes the same view of the question, and urges the magistrates to confine their new building to two stories.

In noticing this letter, the *Westminster Review** says:—

"Agreeing with the general principles laid down by Dr. Conolly on this point, it yet seems to resolve itself into a question of mechanical arrangement. His objection to the third story is on the score of physical labour, in ascending and descending. But this labour would not exist in a well-arranged asylum. Apart from these considerations there is no doubt that the average atmosphere is purer and better adapted for human breathing at a height of from fifty to one hundred feet above the surface of the earth than it is at the surface, whether that surface be composed of clay or gravel. The air is drier at that height, as we get beyond the line of surface evaporation, and within that line the deleterious gases are found most prevalent. Low spirits are synonymous with moisture; the nerves become flaccid and unbraced, like stringed instruments out of tune. Moist air carries off the electricity from the body; dry air does not. Moist air, with heat, is the atmosphere of fever and liver complaint. Moist air, with heat and stillness, is the atmosphere of putridity, the paradise of mosquitoes."

"In deep mines and in lofty factories, where the saving of human labour is an important element in profit, machinery is adopted to raise and lower the workmen without muscular exertion. Adapting the same machinery to hospitals and asylums, there seems to be no reason why four, six, or more stories should not be available. A steam-engine, or other labour-saving power, we take it, should be a concomitant of every well-arranged asylum, in order to furnish employment—that essential to the cure of mental disease—to patients. And that employment should be as various as human tastes. The two great sources of human misery are—want of employment, and individuals being misfitted to their employment. We can conceive it possible that an asylum under the best arrangements might be nearly self-supporting,—the patients doing nearly all the work of the establishment. Our ideas on the subject are, that the building should be of *six* stories in height, in the form of a parallelogram, or of two sides of a square, and with machine lifts: one in the centre and one at each end, rising and falling from floor to floor, alternately. The middle lift might serve as an observatory for watching the galleries. The whole should be fire-proof. The steam-engine should keep a constant supply of hot and cold water to the top of the building, and all refuse, wet or dry, should be conveyed down proper shoots. Warm or cold air should be introduced at pleasure through double floors, and gas laid on wherever required. In so large an establishment a gas-work would be a matter of course, and the workshops might be contiguous to it. As the engine would be constantly going, the lifts would be always in motion, but of course staireases would be provided for emergencies. One entire floor, probably the centre, should be appropriated for the residence of the officers of the establishment; and there is no reason why they should not be divided into suites of apartments, as private, and far more convenient than any detached houses. Along the galleries rails should be laid, on which small trucks should run with soft-tired wheels, giving no sound, and communicating with the lifts. In this mode food or fuel could be taken anywhere with the minimum of labour, either up or down. A sound reason, we conceive, for preferring several stories to an extended area, is getting the best aspect for the greatest number of rooms. There is but one south-west, and the best form would be a re-entrant angle forming two sides of a square, one looking south and the other west, over a garden; the galleries of access being at the back of the rooms, at the salient angle. From the centre the view might thus be attained down both wings. The length of the angles being regulated by convenience, they might be multiplied in number, each having the same aspect, yet not overlooking each other."

The height of such a building, with its consequent shade and gloom, presents an insuperable objection in our minds to such an arrangement, even were there none other: the observations, however, are sufficiently suggestive to deserve extracting.

The provision of a sufficient number of single sleeping-rooms, and the avoidance of dormitories with more than eight or ten beds in each, are essential points in a lunatic asylum.

Above all things, however, it is important that the building should be fire-proof. The commissioners, in their instructions, say:—"The staircases throughout the building should be of stone. In all cases, the store-rooms for inflammable stores should be thoroughly fire-proof. If timber floors are used, there must be a disconnection of the floor and joists at all the internal doorways, by means of a stone cill; similar separations, at not greater distances apart than 50 feet, should be made in the floor and joists of the galleries or corridors; and provision should be made for a complete fire-proof separation of the timbers of the roof, at distances of not more than 50 feet, according to the arrangements of the plan."

This, however is not sufficient to prevent the most fearful calamity in the event of a fire occurring. In all buildings appropriated to the sick, the infirm, or the old, the whole structure should unquestionably be fire-proof. Even in

* October, 1847, p. 112.

our ordinary dwelling-houses the absence of precautions in this respect is most short-sighted and blameable. We earnestly urge on the magistrates the necessity of attention to this in the proposed new asylum.

A few words now as to the designs for this building, which have been selected, premising that the land on which it is to be erected is situate at Bet's Stile, near Colney Hatch, between Finchley-common and Southgate. It consists of about 119 acres, lying on both sides, but chiefly on the west side of the Great Northern Railway, and has a sharp slope to the south-east. On the north side is a lane which runs from Colney Hatch to Bet's Stile. The first selected plan (by Mr. Daukes,* premium, 300*l.*), or rather plans, for there are three,—one for a two-story building, one for a three-story building, and a third, partly of one and partly the other—has the entrance-front next this lane, and presents a long straight line of building, from east to west, with wings at each extremity, extending from the central line on the two-story plan both north and south, and on the three-story plan to the north only. The offices are on the south side, and will interfere with the appearance of the building, as seen from the railway. The plan appears to have been well considered; the galleries are light and airy, chiefly single-warded; and the arrangements generally good, but the building being spread out so far as it is, the distance to the kitchen from some of the wards is very great. Externally, little has been aimed at: the dwelling-house style has been adopted (rusticated quoins and a dentil cornice), with a plain bell turret in the centre of the main building. In one of the perspective views the building is shewn to be roofed in compartments, and has the appearance of consisting of a number of distinct buildings brought together. The estimate cost of the building, if the accommodation be obtained in two stories, is 85,000*l.*; if in three stories, 75,000*l.*

It is right we should say that we have a personal bias in favour of the second design selected (by Mr. G. Godwin and Mr. Harris,† premium 200*l.*), and leave our readers to form their own judgment. This bias, while it aids, perhaps, in leading us to give unqualified preference to the second design both as regards arrangement and architectural treatment, forbids us to do more than describe it. The plan is the H shape on a large scale, two stories in height, with three short lateral projections towards the east and three towards the west, giving the means for very perfect classification and separation. The entrance is in the centre of the south front, to which importance is given by the chapel, which projects forward, and a clock tower rising from the main building behind.

In this design the females occupy the western division, and the males the eastern division; these are connected with the chapel and central offices by wards for aged and quiet patients on the female side, and by a passage at the back of various domestic offices and workshops on the male side, as well as by verandahs on the outside of the building.

The arrangement of the bedrooms and galleries is a modification of the single and the double-sided system, viz., of wards which have bed-rooms on one side only, and those which have bed-rooms on both sides. By the adoption of this plan, the asylum would not cover so large an area as it would if constructed with the single row of bed-rooms throughout, and it tends materially to keep down the expense of erection. The galleries are 11 feet in width, with a large window at the extreme end of each; these windows, together with open compartments for taking the meals, leave the asylum perfectly free from dark corners, and, at the same time, give a cheerful view of the surrounding country. By this arrangement, there are no nooks or hiding-places, and it is favourable for inspection.

The whole of the building was proposed to be fire-proof, the stories being separated by brick arches, and the roofs, sashes, and shutters, formed of cast or wrought-iron. The style adopted is Tudor, the materials red brick with white-brick dressings, excepting the central portion, where stone would be used, and the estimated cost was 82,000*l.* For a three-story building the cost was put at 75,000*l.*

The authors of the third design (Messrs. Allom and Crosse,* premium 100*l.*) appear to have inclined to a three-story building. The plan, as in number 1, presents an extended straight line of building, with a wing at each end projecting towards the south, and then again extending towards the east on one side, and towards the west on the other. The wards are mostly double. The style is Elizabethan, the materials red brick with white brick or stone dressings; and the estimated cost, if we understood rightly, also 75,000*l.*, a curious coincidence, considering that no amount was stipulated by the magistrates. The plan for affording accommodation in a two-story structure shews a square pile of building at each end of the main line, surrounding an open quadrangle.

There were several very clever designs amongst the rejected plans, but the majority of them were wholly unfit for the purpose, although set forth with much artistic ability at great cost. They shewed a fearful waste of time and money.†

* Motto—"*Humanitas.*"

† Motto—"Practice with Theory."

* Motto, "*Labore et Honore.*"

† We are asked by more than one competitor to bear witness o the polite and considerate attention of Mr. John Skaife, clerk to the committee for providing the asylum, and do so willingly, because we know it is deserved.

AWARDS OF OFFICIAL REFEREES.

ATTACHED OFFICES AND THE RATE OF BUILDINGS.

With regard to two third-rate dwellings in the district of Lewisham, built by Mr. Adams, the surveyor of the district gave him notice of what he considered an irregularity, namely, that certain additions were being built which increased the rate of the original buildings, the external walls of such buildings not being commensurate; also that the walls of these additions were only one brick thick.

This not being attended to, the district-surveyor lodged an information.

At the meeting, it appeared that the area of each of the houses was within 30 inches of the full area of a third-rate house, that is to say, six squares, exclusive of the alleged rear additions; and that, including the area of such additions, each would exceed six squares; that the thicknesses of the walls of the main buildings were such as are required for houses of the third-rate, and the thickness of the walls of the alleged additions was 8½ inches; that the said alleged additions extended through two stories; that such additions were each less than half a square in area, and consisted of a water-closet and a lobby, communicating by a doorway with the house and with the outside of the buildings in each story. It appeared also that such additions had been commenced at the same time with the main buildings, the footings and a few courses of one of the outer inclosing walls of each having been laid at the same time with those of the main buildings, and that toothings had been left in the back walls of the main buildings to receive such additions; and that when the walls of the main buildings had been nearly completed and the roofs were partly on, but not covered in, the builder proceeded to carry up such additions.

The surveyor stated, that under these circumstances he objected to the works, considering that the rule for ascertaining areas (as explained by certain awards of the official referees) required such additions to be included in ascertaining the area of the houses for the purpose of determining the rate, in which case the houses in question would be of the second rate, and their walls insufficient in thickness; and that he could not object to the footings and toothings, as indicating the intention to erect such additions, as they might have been intended for a portico, or other erection not to be included in ascertaining the area; and the Act would not prohibit the present additions if built after the roofs of the main buildings had been covered in.

On the other side it was contended, that the said alleged rear-additions were attached buildings or offices, which, under the rule for ascertaining area, ought to be excluded from the area of the houses to which they belong; but assuming the case to be otherwise, it appeared from a previous award of the official referees between the same parties, that it was the duty of the district-surveyor to have objected in the first instance, when he became aware of the intention to erect such additions, and that, under the circumstances, the official referees would make no direction thereon.

It further appeared that the working drawings of the buildings in question, being plans and sections of the same, upon which the said alleged additions appear in manner as they have been built in connection with the main buildings, were laid before the district-surveyor at the commencement, or at some time within a week after the actual commencement of the works.

The referees decided, "That the two rear-additions referred to in the said information, and hereinbefore described, being each a water-closet, with a small lobby thereto in each of the two stories throughout which the addition in each house respectively extends, and capable of being used only as closets and not as apartments, are offices belonging to the main buildings, and that inasmuch as the area of every building is to be determined by the number of squares contained in the surface of any floor which shall contain the greatest number of squares at or above the principal entrance to such building, but excluding from such surface the area of any attached building or office, area, balcony, or open portico; the said rear-additions, notwithstanding the communications with the main buildings through the back external walls of such buildings, may be built with the main buildings without increasing the rate of such main buildings; and that inasmuch as such offices are to be deemed in respect of the walls thereof, and all other requisites, as buildings of the rate to which they would belong if built separately, and are (when so rated) buildings of the fourth-rate of the first, or dwelling-house class, and the walls thereof are not of less thickness in the two stories than 8½ inches, the same are not contrary to the Metropolitan Buildings Act."

Expenses to be paid jointly by the surveyor and the builder.

WHAT SHOULD A SANITARY BILL CONTAIN?

Sir,—I think no time could be more opportune than the present to impress upon the new Parliament the necessity for early, efficient, comprehensive, and stringent legislation upon the sanitary system. After having been twice upon the point of success (however partial and imperfect that first success might have been), I do not doubt but that the third attempt will be successful, and I consider that we have now even stronger grounds for requiring a complete and really effective "bill of health" than we previously had, as the patient has been getting worse, and therefore requires stronger remedies than were at first proposed to be administered. I will then, with your permission, say a few words regarding the extent to which those remedies ought to be applied, and as to what they ought to be; and I hope that our lawgivers will see the policy of giving us a law which may be as nearly as possible perfect, as tending to save themselves and the public generally much trouble, and of promptly putting an end, as

far as possible, to the dreadful and wholesale extermination which has been, and is at present, going on amongst the masses of the population, to an extent considerably greater (as has been repeatedly shewn) than would be the case were we involved in a "perpetual civil war." As regards the extent of the proposed bill of health, and other accompanying remedial measures, they should not be selfishly confined to England, but the whole of Great Britain and Ireland should have the benefits which will assuredly result from them; and above all, I would bring the *metropolis* within the pale of the bill, as most of all requiring supervision.

The remedial measures of which I spoke in conjunction with the "bill," are the window-tax, the brick excise, and the soap excise, which ought immediately to be abolished; indeed, the only objection to such a step is, that they are sources of revenue; but when there are so many other means of raising taxes which would not operate so injuriously as these do (for instance, by a rightly-modified property-tax), that objection only appears in the light of a quibble. And here I would remark, with respect to an excellent suggestion which recently appeared in THE BUILDER, viz., the formation of societies all over the country, for the purpose of rendering the evils of these taxes more generally known, that I hope the brickmakers will take the lead in such a movement, as I believe the public are not sufficiently aware of the bad effects of the brick duty.

Amongst the remedial measures for which a separate but also coeval Act would be required, I class the removal of Smithfield market and the slaughter-houses with which it is surrounded, and the establishment of other markets and abattoirs in more suitable and suburban localities. The other points on which it would be desirable to legislate might all be included in the "Bill of Health," or the Sanitary Act (in prospective), and I will first briefly mention them:—

1. Sewerage and drainage.
2. Paving.
3. Scavengering.
4. Supply of water.
5. Supply of gas.
6. Prevention of intra-mural burial.
7. Establishment of cemeteries.
8. Establishment of public baths and wash-houses.
9. Establishment of public necessaries for both sexes.
10. Regulation of noxious and dangerous businesses.
11. Establishment and management of fire-escapes and fire-engines, and other means for extinction of fire.
12. The obligation to consume the smoke produced in manufactories and river steamers, or in the case of the latter, to burn coke.
13. The prevention of the use of unhealthy underground cellars as living rooms.
14. The opening up of narrow courts and alleys, and in some cases their abolition.
15. Ventilation.
16. Establishment of public gardens and playgrounds, &c.

Let us now consider some of the above subjects in the order in which they are placed; and it may be remarked, in passing, that although these observations may apply, for the sake of exemplification, more particularly to the metropolis, yet they are not on that account to be considered inapplicable to other places. I cannot help thinking that the efforts which have been made for the exclusion of the metropolis, and more particularly the "city," from the operations of the general bill, are merely a subterfuge for the real purpose of excluding the metropolis altogether from any sanitary improvement, in order that the corporation, the commissioners of sewers, paving, &c., and the various parochial vestries, may retain the power in their own hands, and that, in fact, those who are so clamorous for exclusion from the general bill do not desire a separate bill. However, to return to my sixteen heads:—First, as regards Sewerage and Drainage, perhaps the most important of the whole.

The general arrangement of the sewers, I think, should be such as have been, in part at least, adopted in the Holborn and Finsbury, and Westminster divisions of the metropolis, more especially as regards the provisions of the bill lately obtained by the commissioners of the latter district. The sewers, all agree, should be of the egg or oval shape, and of no greater size than is absolutely necessary for all present and reasonably prospective wants. All sharp angles in the sewers (and drains too) should be carefully eschewed, and the junctions formed of gentle curves in the direction of and so as to offer the least impediment to the current. This should be always enforced in the formation of house-drains, and their connection with the sewers. The sewers should have shafts or other means for the removal or neutralizing of the noxious vapours which are generated by the sewage matter. The material of the sewers, if small, might be glazed stoneware socket-pipes, the best material for drains also, (but green bottle glass socket-jointed pipes, as suggested in THE BUILDER, would do as well); and the large sewers should be formed of hard bricks. Terro-metallic bricks might be used with advantage, and would be better if glazed,—of a wedge shape, made to suit the form and size of sewer, and set in suitable cement or mortar.

There should be a compulsory clause in the bill, obliging the formation of public sewers in every public place, whether street, court, or alley, &c., and wherever a sewer exists within a reasonable distance, or wherever one may be formed, every dwelling-house should have an efficient trapped drain into the sewer, as well as all workshops and manufactories also. This clause of the bill should in every case be strictly enforced.

No sewage matter should be discharged into the river (and this applies equally well to all other towns, &c.); but it should be conducted to a considerable distance, and applied to agricultural purposes.

Immense advantages would accrue to the public if this system of conveying the sewage manure into the country were generally adopted. In the present state of things, the larger the number of sewers and drains constructed in the metropolis, and the more efficient its sewerage and drainage in other respects becomes, the more the Thames itself will approximate to a large open sewer; and I firmly believe that if we persist in discharging the contents of our sewers into the river, it will ere long become such an intolerable nuisance, that we shall be compelled to, shall I say "arch it over," as was the case with the "Fleet ditch," which was formerly a navigable "river," but has now, alas! degenerated into a common sewer. What would your readers think of the "Thames ditch," or the "Thames sewer," being the designation of "Old Father Thames?" Any one who has been in the habit of travelling by the river steamers, or who has resided or been taken by his avocations in the neighbourhood of the Thames, must be fully aware of the stench which arises from the river, especially at low water, when the accumulations of filth are exposed to the air: and the water, as is well known, contains so much filth in solution, that it cannot be used for any household purposes without filtration, which would not be the case if the sewage of the metropolis were not emptied into it, and the manufactories (gas works among the rest) were not allowed to throw what they deem their refuse (?) into our great highway.

A private company propose to obviate the evil; but although I am confident that the principle is good, yet I should not like to see it carried out by the company, for the following reasons:—

Because their scheme does not embrace the whole of the metropolis, and because the profits which would be derived from the undertaking would go into the pockets of the shareholders; whereas, were the same plan applied to the whole of the metropolis, under the superintendence of a General Metropolitan Sanitary Commission, the returns would enable them to considerably reduce, or perhaps abolish altogether, the sewer-rates; and in the hands of a public body it would be carried out with more attention to the public interests than by a private company.

The remaining points under my first head, which should be included in the Act, are the compulsory establishment in every dwelling-house, workshop, manufactory, &c. of water-closets, and the abolition of privies and cess-pools.

I will now proceed to the second subject—Paving.

The benefits of good paving should be extended to all footways and carriageways within the jurisdiction of the Act. For streets where the traffic is not very great red brick might be used, as at Brighton, or hard bricks or tiles in patterns. For carriageway paving, either small granite, as on London and Blackfriars bridges, or wood, might be used. The latter material is capable of great improvement; the wood, previous to being used, should undergo a chemical preparation, to harden and preserve it from decay. A good foundation, both for foot and carriageways, is a great requisite, not only to prevent settlements, but also to prevent the surface water from penetrating into the earth, and thus finding its way into the basements of houses, cellars, &c. This may be attained by the use of good concrete, or, what is better still, small granite, such as is used for macadamizing, run in with gas-tar, another use for the refuse (?) of coal-gas, and fine gravel. The paving should also be well grouted in, after having been first rammed, and it should not be used immediately afterwards, as is now the custom.

The macadamizing system seems unfit for application in towns; indeed, it should be only used for country roads. If you observe any of the streets of London which are macadamized, in wet weather you will find that they are always muddy, whereas those streets which are well paved with granite or wood, are always much cleaner. I do not mean to say that they are as they ought to be, because the scavengering (to which I shall refer presently) is so bad, that this cannot be expected; but still they are better in this respect. As a case in point, I have never seen Fleet-street cleaner than after a heavy shower of rain, and I have never observed parts of Oxford-street, which are macadamized, in a more filthy state than under the same circumstances. In dry weather, also, the macadamized roads are more dusty than paved roads; indeed, well paved roads, if kept properly swept, would be entirely free from both dust and mud, and such a state of things will, I hope, be attained ere long. Good paving is quite as essential as good drainage, indeed, it is itself a system of surface drainage, and sewers and drains are of very little use without it.

I have stated that a good foundation is a great desideratum in order to prevent settlements in the paving, which break the curve of the roadway and form puddles in wet weather, besides causing a continual expense in relaying the paving; but however good a foundation is made when the paving is first put down, it cannot be long retained while the roadways are continually being broken up to get at the gas and water-pipes.

The chief cause of the partial failure of the wood paving is simply this:—The grooves get choked up with mud, so that a smooth surface is formed, which renders it dangerous for the horses in wet weather, but this may be easily remedied by all the grooves being formed at exactly regular distances, and by the use of rakes with teeth to fit the grooves, and which the scavengers should use before sweeping the wood paving. This brings me to my third subject—Scavengering.

It must be admitted that there has been some improvement of late in the metropolis, and in the "city" in particular, in this respect, but the system is still very ineffective as regards the principal streets which, in the "city," are swept by men who are stationed the whole of the day along the principal lines of thoroughfare, and are provided with a broom and shovel, and an iron vessel somewhat like a pail, in which they deposit the sweepings, until the cart comes round to receive its contents; but this arrangement is a decided failure, and the best proof of this is, that the streets where it is adopted are never thoroughly clean except in dry weather, while the smaller streets, which are swept once a day, in the ordinary manner, are always in a much better state, although there is room for improvement in them. I consider that the principal streets, where the traffic is great, should be swept by a gang of men, accompanied by a cart or carts, twice a day, in the morning and in the afternoon; and the smaller streets, lanes, courts, alleys, squares, &c., once a day, in the same manner; and the foot-ways as well as the carriage-ways should come under the operations of the scavengers. In dry weather the streets, before being swept, should be watered, otherwise clouds of dust are raised to the great detriment of the shopkeeper, and the great -in

convenience and danger of the passenger; and if this plan were carefully carried out, there would be no need to water the streets at any other time, as there would be very little or no dust left to require it. The streets should be watered by water from the Thames (which would be also available in case of fire, and for cleansing the sewers), and which should be laid on to every street, &c., by pipes, which should be always kept charged, and applied to the streets by means of plugs, and a hose with a wide-mouthed, finely-perforated rose at the end.

The fourth point is the supply of water, which the Act should require to be constant and universal,—that is to say, the pipes, which should be always charged, should extend to every public place, and the water should be laid on to every dwelling-house, and supplied at a moderate charge. Should the sewers, as proposed, be diverted from the Thames, its water might perhaps be available for domestic purposes as well as for the watering, and perhaps occasional washing, of the streets, cleaning sewers, extinguishing fires, &c. All public pumps and springs should be carefully preserved and kept in order, and others formed in localities where they do not at present exist.

Then, as to the supply of gas. The Act should require every public place, whether street, court, or alley, to be well lighted with good gas, at a moderate price; and should the existing companies refuse to do this, or in places where no gas-works exist, the sanitary commission or commissioners should be required to establish works of their own; and the profits derived from this source should be applied to the reduction of the rates. Electricity might be applied to the lighting of the public lamps with advantage.

Instead of burying the gas, water, electric telegraph, or any other pipes under the roadways, as at present, they should, as already urged by you, be inclosed in underground tunnels, somewhat similar to sewers, with communications with every house, &c., by means of earthenware or terro-metallic pipes, so that any alterations or repairs to the pipes might be done at any time without the necessity of breaking up the roadways and paving, the expense of which would, of course, be saved.

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The consideration of other points must be left till next week. A LONDONER.

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THE STATE OF THE BUILDING TRADE.

SIR,—I am gratified, as will no doubt be many in the trade, to find the leading article of your last number but one touching upon the subject of competition, and more gratified to find you promising to return speedily to it. It is a subject of such grave and serious importance, that doubtless there is scarcely any thing at the present time which more requires continued and increased agitation, in order that men's eyes may be opened to see the absurdities they have been indulging in, by carrying out the pernicious system to trade of making contracts any how, and under any terms and obligations. In the present disastrous state of things it would be well if all our journals were found endeavouring to outvie one another in exposing the follies, and I may justly say cruelty, produced by fostering the bane to a nation's welfare and the good feeling of its various members in society. So great a curse is competition, and so great a drawback to every thing that is just and honourable to a country, especially such as this, that it is the duty of a just and humane government to make a most searching inquiry into its effects, and the present and probable consequences to the people in general. You say you have received a number of letters of a contradictory character. This must naturally be expected, as it is not likely that the class who are benefited by the oppression of their less fortunate brethren should be anxious for a change. When we find a young architect, who, having little or no connection, in order to obtain one, stoops to means knavish and worthless, can we expect such a one to desire a change from the present reckless, cut-throat system? As an illustration, I herewith mention a circumstance, one out of many that have come within my own notice. A few years since I was acquainted with a shrewd intelligent man, one of our old-school surveyors, who was occasionally employed by a young man, an architect,—one who had but a short time previously commenced business,—to take out quantities for builders to tender from for various works he had occasionally to execute. The instructions we received from him were to this effect: "I wish you to understand that I require, in taking out your measurements, that you cut them as fine as a hair (a term not unknown to many pettifogging surveyors at the present time), pinch them, in fact, every way. The interests of the builder stand to us for nothing; the interest only of our *clients* we must regard." But this worthy young architect—this young wiseacre—knew not the integrity of the man with whom he was dealing. It has been frequently remarked, and I regret to say it is a fact beyond all dispute, that architects have been great auxiliaries to the ruin of the trade, as hundreds of examples would tend to confirm. I will furnish one of many within my own knowledge.

About ten years since a builder, with whom I had been long acquainted, had among his customers a gentleman of rank and title, and for whom, at various times and to his satisfac-

tion, he had performed much work. It happened that he now required an alteration of some extent, and gave directions for plans to be furnished of the same. The builder unfortunately introduced an architect, one whom he esteemed a sincere friend (and who is at the present time held in high repute) to furnish the same instead of himself. The gentleman agreed to the proposal; the plans were furnished (and good ones they were, though not free from extravagance); but this worthy architect, instead of placing the work to be executed by the person who obtained him the employment, immediately proposed general competition for the same, alleging that it would be done at a cheaper rate thereby. His whining persuasions had the desired effect, and the builder afterwards lost the future works of the gentleman he had so long retained. What is the scheme of many of our architects now? It is not generally known, but it is a truth, they are using every exertion to cripple little builders, and throw all their works into the hands of a few of our large ones,—some even have the hardihood to avow it.

If these practices are to continue, (and they are more likely to increase than diminish,) surely it is high time that a body of men like master builders should arouse from the lethargy in which they have so long been at ease, and take immediate measures for the overthrow of such a system as the present, and if they do not, insolvency and bankruptcy must henceforth be before their eyes, although we think there has been enough of that for these past few months to make up for the next hundred years, at least it is to be hoped such is the case. The present practices want a thorough uprooting, and a regeneration of things is absolutely necessary, if trade is again to be put in a sound and healthy state.

There has been a growing system for the last few years of furnishing quantities to builders about to compete, in some instances a surveyor being employed by the architect only for the purpose, and in others one being appointed by the builder also. In both cases the system is (and I say it from experience) *bad*, very *bad;* in the former case especially, nine times in ten it is disastrous to the builder. As one proof out of many I could name, not long since I knew a case where of Caen stone some hundreds of feet were omitted, and other articles were deficient, though not to such an extent. Should this reach the eye of parties who have some knowledge of the same, let them not attempt a contradiction, for in my possession are the bills of quantities and the dimensions, as furnished by the surveyor. It is a wiser plan altogether for each competing builder to have his quantities taken for his own especial use; it is not only more satisfactory, but the competitors become less in number likewise. But why, I should like to know, if we must have competition, why should not it be done by schedule of prices, as it was formerly? Surely it is a more honourable and honest way; besides, it gives employment to a most useful class of men, now all but extinct, viz., the surveyor, and it puts a check upon undue speculation; but without a combination we cannot again hope to see an improvement in the present state of things—a state of things bordering on perfect madness.

A correspondent observes, that it is now getting quite common to apply for an estimate, and then hawk the same about from one tradesman to another, in order to get the work done at a cheaper and still cheaper rate. This is correct; the mischief, however, ends not here. The subject is discussed with friends at the dinner and tea table, and the man of principle—he of the live-and-let-live ideas—has his mind thereby perverted, and he commences the system hitherto new to him; and so, from friend to friend, this pernicious doctrine is conveyed, till all just and honourable feelings are entirely lost. In the article of which I have before spoken, you question the truth of builders sending in nominal amounts: it is of every-day occurrence. It is even said that, among the largest builders, in nine cases out of ten, the contract is selected by the body for one. I remember a case myself where a contract, a few years since, was to be delivered for some works, under 5,000*l.* An hour or so before the time named for the delivery of the tenders, the builders met, opened their tenders, and prepared fresh ones. It was then and there arranged that 400*l.* should be added on each estimate, which said sum should be divided among the parties competing,—the measure was carried out, and the tenders delivered in due form, the lowest party being the successful man.

We are, certainly, all in a state of monomania, as regards trade; we certainly have forgotten that God created man to be dependent upon his fellow—the rich for the poor, and the poor for the rich; and we are forgetting that, if we subvert these laws, we must naturally go on increasing more and more in degeneracy, and, at last, we shall discover that we have acted no better part than some poor maniac, who, in his animosity, has been his own greatest oppressor.

A Surveyor.

POSITION OF ARTISTS.*

Among the ancients, artists were the teachers of the people, and their works stood in the place of lectures on religion, morality, and history. Since the press has diffused its influence over all nations and classes, the arts of design are no longer so important as a part of public instruction, though still lending an useful aid to civilization, enlarging the sphere of intellectual enjoyment among the people, raising their moral character, and thus assisting in the maintenance of order. Good taste is nothing more than an emanation of knowledge, and can seldom be found but in minds which have been well educated and cultivated; it is, in fact, nothing more than the feeling in which all such minds are agreed, and the result of a common discipline. There may be truth in the saying that the artist, like the poet, is born, not made; and sometimes great works are produced by untutored genius; but in general the maxim of Horace will apply to every art:—

> 'ego nec studium sine divite vená,
> Nec rude quid prosit video ingenium.'†

Few artists can rise to the standard of a refined taste, without a better cultivation of the mind than can often fall to the lot of natural talents in this country of expensive education. Even with the most happy union of genius and cultivation, he will not be saved from the necessity of complying with the taste of an ill-educated public; because, in the absence of all other protection, the favour alone of that public can enable him to gain a livelihood by his profession. If a painter rise above the vulgar taste, his works will often remain unsold. An enlightened patron may occasionally secure to him a reward for the completion of some more elevated purpose; but such rare exceptions to the generality of purchasers will hardly, in the utmost conceivable aggregate, maintain the artist in his proper position in society, unless he devote also a large portion of his time to works adapted to the general market, such as portraits, scenes taken from the fashionable drama or romance,—works, in short, which, instead of aiming at a permanent reputation, recommend themselves merely as an elegant kind of furniture for the houses of those whose principal occupations are to accumulate wealth, and to employ its superfluities in a rivalship of ostentation.

The worldly condition of sculpture is still worse than that of painting, sculpture requiring a more educated mind, a more perfect conception of the beautiful, and a greater stretch of intellect in embodying that conception. The learned and skilful sculptor is therefore more rarely found: he meets with a smaller number of congenial minds to appreciate his efforts; and among the lower classes scarcely any that can understand them. And yet he has some advantages over the painter. While the latter, in his more perishable productions, derives little or no assistance from the ancients, the sculptor has the opportunity of studying some of those ancient specimens of the plastic art which seem to us like the productions of a different species of mortals. In high patronage, also, the sculptor has an advantage, in the public demand which continually occurs for memorials of great events or of distinguished individuals,—works which cannot easily be confined to Gothic sculpture. Nevertheless, the advances made in sculpture have not been such as the establishment of a rich museum of ancient works in the metropolis gave some reason to hope for, either in that first step to improvement, an imitation of ancient art, or in the application of the taste and skill so acquired to modern purposes: the demand for public monuments has not produced sufficient capacity to execute them, and the profession of a sculptor, like that of a painter, is chiefly supported by the manufacture of portraits,—a very pleasing branch of art, but created to gratify feelings of vanity or affection, totally unconnected with cultivation of mind, and indicating, by the immense preference given to it, the low intellectual tone of the present age, as well as that something more than commercial protection is required for improvement in the arts of design, not less than in science and literature.

* * * *

Had science possessed its due influence or authority during the past century, many great works essential to the safety or prosperity of the country would not at this time remain to be done; nor others of comparative inutility have been executed at an enormous expense, such as the royal canals of Scotland and Ireland, the Waterloo-bridge, and the Thames-tunnel. There would probably have been a better management of public works, a better system of naval architecture; and when steam was applied to communication by sea and land, the Councils of Science might have saved the community from much of the needless expenses, gambling and ruin, the mechanical errors, and disregard of the public safety, which the rapid increase of disposable capital in England, and an insatiable thirst of high profits, have occasioned in the prosecution of this great social improvement. Nor is it likely, if Science had had its due share in the national councils, that the taste and arts of England would have had for their representatives the York and Nelson columns, the discordant architecture and disproportionate objects which meet the view in Trafalgar-square, or the colossal figures on either side of the western entrance of the metropolis: one a copy of an antique figure holding a horse, which has been forced into the representation of a combatant; the other, an equestrian statue in repose, on the summit of a lofty arch.

* From "Thoughts on the Degradation of Science in England." By F. R. S. Rodwell, Bond-street.

† De Arte Poetica, v. 409.

COMPENSATION—BATTERSEA PARK.

The first of a series of claims which have been made in respect of property required for the intended park at Battersea, was tried on the 2nd inst. before the Sheriff of Surrey, at the Horns-tavern, Kennington. The case was that of a Mr. Chabot, who claimed 10,212*l.* for three acres of land on the shore of the river.

In support of this claim his counsel called the following surveyors, viz.:—Mr. Porter, who, as we understand, valued the property at 9,499*l.*; Mr. Tress, at 8,578*l.*; Mr. Lee, at 8,500*l.*; and Mr. Hunt, at 7,115*l.* Mr. Lee and Mr. G. L. Taylor also valued the property upon the assumption that the claimant might inclose a further portion of the river; and, upon such assumption, Mr. Lee valued the property at 11,215*l.*; Mr. Taylor, 9,642*l.*

It was elicited, upon cross examination, that the owner had purchased the property at public auction from the late Earl Spencer, in 1835, for 120*l.* The jury viewed the ground, and, after a protracted inquiry, returned a verdict of 750*l.*!!

A correspondent asks whether more fools than rogues were concerned in this inquiry, and where he ought to look for them, in the witness or the jury-box?

Mr. Chabot complains gravely of the injustice done him. It appears that the sum given was for one acre only, the claimant's right to two acres, formerly a wet-dock, being disallowed, without notice to him that his title would be questioned.

Improvement of Labourers' Cottages.—The fourth report of the Northumberland Cottage Improvement Society* contains plans, elevations, and estimates of cottages erected at Craster; at Choppington, near Morpeth; at Doddington, and at Rock: they present nothing new, but, as serving to point attention to the necessity of improving the dwellings of the labourer, the efforts of the society deserve great praise.

* Whitaker, London; Smith, Alnwick.

convenience and danger of the passenger; and if this plan were carefully carried out, there would be no need to water the streets at any other time, as there would be very little or no dust left to require it. The streets should be watered by water from the Thames (which would be also available in case of fire, and for cleansing the sewers), and which should be laid on to every street, &c., by pipes, which should be always kept charged, and applied to the streets by means of plugs, and a hose with a wide-mouthed, finely-perforated rose at the end.

The fourth point is the supply of water, which the Act should require to be constant and universal,—that is to say, the pipes, which should be always charged, should extend to every public place, and the water should be laid on to every dwelling-house, and supplied at a moderate charge. Should the sewers, as proposed, be diverted from the Thames, its water might perhaps be available for domestic purposes as well as for the watering, and perhaps occasional washing, of the streets, cleaning sewers, extinguishing fires, &c. All public pumps and springs should be carefully preserved and kept in order, and others formed in localities where they do not at present exist.

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On this subject the *Washington Union* remarks,—"The present fashion in our cities, of modernizing everything ancient, together with the increased and fast increasing value of building lots, is rapidly uprooting from our hearts a spirit of feeling which should never be destroyed—a feeling of veneration for the mementos of our great and remarkable men. Their ancient dwelling-places, which, but a glance at, used to bring up such countless recollections, are being rapidly obliterated. The old dwelling-house and shop, with all that association throws around them, are torn down to give place to some stately mansion, where man's pride and pomp may glory and display itself, or some spacious warehouse, where his goods may be stored and his gains counted."

THE STATE OF THE BUILDING TRADE.

SIR,—I am gratified, as will no doubt be many in the trade, to find the leading article of your last number but one touching upon the subject of competition, and more gratified to find you promising to return speedily to it. It is a subject of such grave and serious importance, that doubtless there is scarcely any thing at the present time which more requires continued and increased agitation, in order that men's eyes may be opened to see the absurdities they have been indulging in, by carrying out the pernicious system to trade of making contracts any how, and under any terms and obligations. In the present disastrous state of things it would be well if all our journals were found endeavouring to outvie one another in exposing the follies, and I may justly say cruelty, produced by fostering the bane to a nation's welfare and the good feeling of its various members in society. So great a curse is competition, and so great a drawback to every thing that is just and honourable to a country, especially such as this, that it is the duty of a just and humane government to make a most searching inquiry into its effects, and the present and probable consequences to the people in general. You say you have received a number of letters of a contradictory character. This must naturally be expected, as it is not likely that the class who are benefited by the oppression of their less fortunate brethren should be anxious for a change. When we find a young architect, who, having little or no connection, in order to obtain one, stoops to means knavish and worthless, can we expect such a one to desire a change from the present reckless, cut-throat system? As an illustration, I herewith mention a circumstance, one out of many that have come within my own notice. A few years since I was acquainted with a shrewd intelligent man, one of our old-school surveyors, who was occasionally employed by a young man, an architect,—one who had but a short time previously commenced business,—to take out quantities for builders to tender from for various works he had occasionally to execute. The instructions we received from him were to this effect: "I wish you to understand that I require, in taking out your measurements, that you cut them as fine as a hair (a term not unknown to many pettifogging surveyors at the present time), pinch them, in fact, every way. The interests of the builder stand to us for nothing; the interest only of our *clients* we must regard." But this worthy young architect—this young wiseacre—knew not the integrity of the man with whom he was dealing. It has been frequently remarked, and I regret to say it is a fact beyond all dispute, that architects have been great auxiliaries to the ruin of the trade, as hundreds of examples would tend to confirm. I will furnish one of many within my own knowledge.

About ten years since a builder, with whom I had been long acquainted, had among his customers a gentleman of rank and title, and for whom, at various times and to his satisfac-

tion, he had performed much work. It happened that he now required an alteration of some extent, and gave directions for plans to be furnished of the same. The builder unfortunately introduced an architect, one whom he esteemed a sincere friend (and who is at the present time held in high repute) to furnish the same instead of himself. The gentleman agreed to the proposal; the plans were furnished (and good ones they were, though not free from extravagance); but this worthy architect, instead of placing the work to be executed by the person who obtained him the employment, immediately proposed general competition for the same, alleging that it would be done at a cheaper rate thereby. His whining persuasions had the desired effect, and the builder afterwards lost the future works of the gentleman he had so long retained. What is the scheme of many of our architects now? It is not generally known, but it is a truth, they are using every exertion to cripple little builders, and throw all their works into the hands of a few of our large ones,—some even have the hardihood to avow it.

If these practices are to continue, (and they are more likely to increase than diminish,) surely it is high time that a body of men like master builders should arouse from the lethargy in which they have so long been at ease, and take immediate measures for the overthrow of such a system as the present, and if they do not, insolvency and bankruptcy must henceforth be before their eyes, although we think there has been enough of that for these past few months to make up for the next hundred years, at least it is to be hoped such is the case. The present practices want a thorough uprooting, and a regeneration of things is absolutely necessary, if trade is again to be put in a sound and healthy state.

There has been a growing system for the last few years of furnishing quantities to builders about to compete, in some instances a surveyor being employed by the architect only for the purpose, and in others one being appointed by the builder also. In both cases the system is (and I say it from experience) *bad*, very *bad;* in the former case especially, nine times in ten it is disastrous to the builder. As one proof out of many I could name, not long since I knew a case where of Caen stone some hundreds of feet were omitted, and other articles were deficient, though not to such an extent. Should this reach the eye of parties who have some knowledge of the same, let them not attempt a contradiction, for in my possession are the bills of quantities and the dimensions, as furnished by the surveyor. It is a wiser plan altogether for each competing builder to have his quantities taken for his own especial use; it is not only more satisfactory, but the competitors become less in number likewise. But why, I should like to know, if we must have competition, why should not it be done by schedule of prices, as it was formerly? Surely it is a more honourable and honest way; besides, it gives employment to a most useful class of men, now all but extinct, viz., the surveyor, and it puts a check upon undue speculation; but without a combination we cannot again hope to see an improvement in the present state of things—a state of things bordering on perfect madness.

A correspondent observes, that it is now getting quite common to apply for an estimate, and then hawk the same about from one tradesman to another, in order to get the work done at a cheaper and still cheaper rate. This is correct; the mischief, however, ends not here. The subject is discussed with friends at the dinner and tea table, and the man of principle—he of the live-and-let-live ideas—has his mind thereby perverted, and he commences the system hitherto new to him; and so, from friend to friend, this pernicious doctrine is conveyed, till all just and honourable feelings are entirely lost. In the article of which I have before spoken, you question the truth of builders sending in nominal amounts: it is of every-day occurrence. It is even said that, among the largest builders, in nine cases out of ten, the contract is selected by the body for one. I remember a case myself where a contract, a few years since, was to be delivered for some works, under 5,000*l.* An hour or so before the time named for the delivery of the tenders, the builders met, opened their tenders, and prepared fresh ones. It was then and there arranged that 400*l.* should be added on each estimate, which said sum should be divided among the parties competing,—the measure was carried out, and the tenders delivered in due form, the lowest party being the successful man.

We are, certainly, all in a state of monomania, as regards trade; we certainly have forgotten that God created man to be dependent upon his fellow—the rich for the poor, and the poor for the rich; and we are forgetting that, if we subvert these laws, we must naturally go on increasing more and more in degeneracy, and, at last, we shall discover that we have acted no better part than some poor maniac, who, in his animosity, has been his own greatest oppressor.

A Surveyor.

POSITION OF ARTISTS.*

Among the ancients, artists were the teachers of the people, and their works stood in the place of lectures on religion, morality, and history. Since the press has diffused its influence over all nations and classes, the arts of design are no longer so important as a part of public instruction, though still lending an useful aid to civilization, enlarging the sphere of intellectual enjoyment among the people, raising their moral character, and thus assisting in the maintenance of order. Good taste is nothing more than an emanation of knowledge, and can seldom be found but in minds which have been well educated and cultivated; it is, in fact, nothing more than the feeling in which all such minds are agreed, and the result of a common discipline. There may be truth in the saying that the artist, like the poet, is born, not made; and sometimes great works are produced by untutored genius; but in general the maxim of Horace will apply to every art:—

'ego nec studium sine divite vená,
Nec rude quid prosit video ingenium.'†

Few artists can rise to the standard of a refined taste, without a better cultivation of the mind than can often fall to the lot of natural talents in this country of expensive education. Even with the most happy union of genius and cultivation, he will not be saved from the necessity of complying with the taste of an ill-educated public; because, in the absence of all other protection, the favour alone of that public can enable him to gain a livelihood by his profession. If a painter rise above the vulgar taste, his works will often remain unsold. An enlightened patron may occasionally secure to him a reward for the completion of some more elevated purpose; but such rare exceptions to the generality of purchasers will hardly, in the utmost conceivable aggregate, maintain the artist in his proper position in society, unless he devote also a large portion of his time to works adapted to the general market, such as portraits, scenes taken from the fashionable drama or romance,—works, in short, which, instead of aiming at a permanent reputation, recommend themselves merely as an elegant kind of furniture for the houses of those whose principal occupations are to accumulate wealth, and to employ its superfluities in a rivalship of ostentation.

The worldly condition of sculpture is still worse than that of painting, sculpture requiring a more educated mind, a more perfect conception of the beautiful, and a greater stretch of intellect in embodying that conception. The learned and skilful sculptor is therefore more rarely found: he meets with a smaller number of congenial minds to appreciate his efforts; and among the lower classes scarcely any that can understand them. And yet he has some advantages over the painter. While the latter, in his more perishable productions, derives little or no assistance from the ancients, the sculptor has the opportunity of studying some of those ancient specimens of the plastic art which seem to us like the productions of a different species of mortals. In high patronage, also, the sculptor has an advantage, in the public demand which continually occurs for memorials of great events or of distinguished individuals,—works which cannot easily be confined to Gothic sculpture. Nevertheless, the advances made in sculpture have not been such as the establishment of a rich museum of ancient works in the metropolis gave some reason to hope for, either in that first step to improvement, an imitation of ancient art, or in the application of the taste and skill so acquired to modern purposes: the demand for public monuments has not produced sufficient capacity to execute them, and the profession of a sculptor, like that of a painter, is chiefly supported by the manufacture of portraits,—a very pleasing branch of art, but created to gratify feelings of vanity or affection, totally unconnected with cultivation of mind, and indicating, by the immense preference given to it, the low intellectual tone of the present age, as well as that something more than commercial protection is required for improvement in the arts of design, not less than in science and literature.

* * * *

Had science possessed its due influence or authority during the past century, many great works essential to the safety or prosperity of the country would not at this time remain to be done; nor others of comparative inutility have been executed at an enormous expense, such as the royal canals of Scotland and Ireland, the Waterloo-bridge, and the Thames-tunnel. There would probably have been a better management of public works, a better system of naval architecture; and when steam was applied to communication by sea and land, the Councils of Science might have saved the community from much of the needless expenses, gambling and ruin, the mechanical errors, and disregard of the public safety, which the rapid increase of disposable capital in England, and an insatiable thirst of high profits, have occasioned in the prosecution of this great social improvement. Nor is it likely, if Science had had its due share in the national councils, that the taste and arts of England would have had for their representatives the York and Nelson columns, the discordant architecture and disproportionate objects which meet the view in Trafalgar-square, or the colossal figures on either side of the western entrance of the metropolis: one a copy of an antique figure holding a horse, which has been forced into the representation of a combatant; the other, an equestrian statue in repose, on the summit of a lofty arch.

* From "Thoughts on the Degradation of Science in England." By F. R. S. Rodwell, Bond-street.

† De Arte Poetica, v. 409.

COMPENSATION—BATTERSEA PARK.

The first of a series of claims which have been made in respect of property required for the intended park at Battersea, was tried on the 2nd inst. before the Sheriff of Surrey, at the Horns-tavern, Kennington. The case was that of a Mr. Chabot, who claimed 10,212*l.* for three acres of land on the shore of the river.

In support of this claim his counsel called the following surveyors, viz.:—Mr. Porter, who, as we understand, valued the property at 9,499*l.*; Mr. Tress, at 8,578*l.*; Mr. Lee, at 8,500*l.*; and Mr. Hunt, at 7,115*l.* Mr. Lee and Mr. G. L. Taylor also valued the property upon the assumption that the claimant might inclose a further portion of the river; and, upon such assumption, Mr. Lee valued the property at 11,215*l.*; Mr. Taylor, 9,642*l.*

It was elicited, upon cross examination, that the owner had purchased the property at public auction from the late Earl Spencer, in 1835, for 120*l.* The jury viewed the ground, and, after a protracted inquiry, returned a verdict of 750*l.*!!

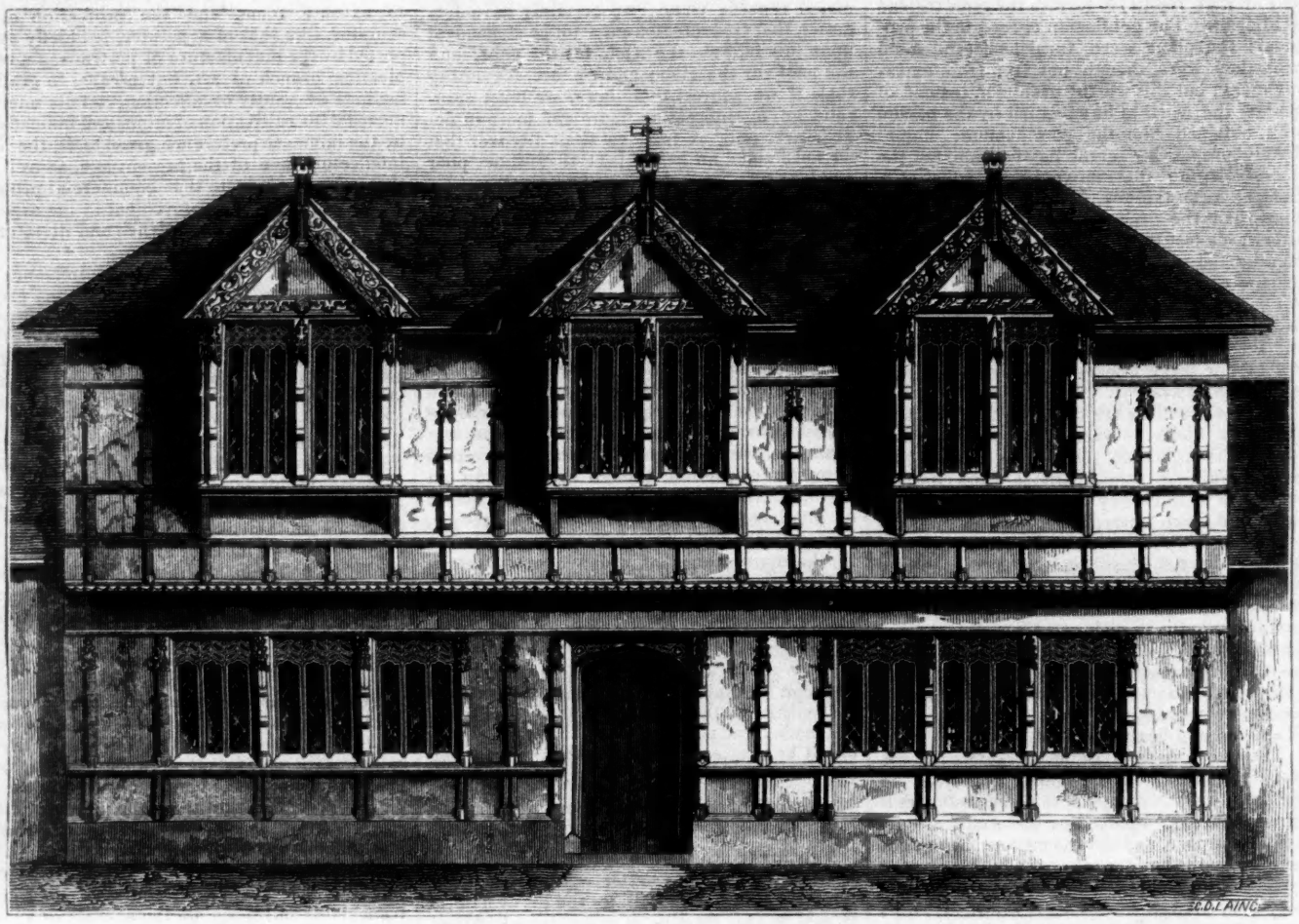
A correspondent asks whether more fools than rogues were concerned in this inquiry, and where he ought to look for them, in the witness or the jury-box?

Mr. Chabot complains gravely of the injustice done him. It appears that the sum given was for one acre only, the claimant's right to two acres, formerly a wet-dock, being disallowed, without notice to him that his title would be questioned.

Improvement of Labourers' Cottages.—The fourth report of the Northumberland Cottage Improvement Society* contains plans, elevations, and estimates of cottages erected at Craster; at Choppington, near Morpeth; at Doddington, and at Rock: they present nothing new, but, as serving to point attention to the necessity of improving the *dwellings* of the labourer, the efforts of the society deserve great praise.

* Whitaker, London; Smith, Alnwick.

FORD'S HOSPITAL, COVENTRY.



ANCIENT STREET ARCHITECTURE.

So very few remains of our ancient street architecture are now to be found, that every good specimen met with should be the more carefully examined. Every year some old building is removed to be replaced by another more in accordance with the taste of the present generation, and although we must much regret the loss of so many beautiful examples of domestic architecture, and feel that our streets have no longer the picturesque appearance they once possessed, yet much is gained on the score of light and air (those great preservers of the public health) by the wide streets and lofty houses of the present day. The great evil has been, that many of these interesting remains have been swept away without any thought or care to preserve correct representations of them; and although some improvement is manifest in this respect (thanks to the exertions of the various archæological societies), still there is much to complain of. Coventry, Chester, and Warwick, have perhaps more remains of street architecture than any other towns in the kingdom, and without doubt some of the most interesting. A few houses are yet to be found in Oxford, Tewkesbury, and other places, and in York are still to be seen some curious examples of entrances to courts, which appear to have been common to several houses. In other towns are some remains of houses, with the details much destroyed, many of them originally used as inns, as the George, at Glastonbury; another at Rochester; the New Inn, at Gloucester (the latter much modernized); and some others. In the market-place at Newark there is also a curious house of the time of Edward IV., built with timber and plaster, several small figures with canopies over them being formed of the latter material. In this as in many other instances are long ranges of windows extending across the whole front. We have been particular in pointing out as many specimens as occur to us, feeling sure that in some instances attention need only be called to them to prevent their being wantonly swept away; or if that is unavoidable, that at least some satisfactory representations of them may be taken.

Ford's Hospital, at Coventry (the street elevation of which is the subject of the accompanying illustration), is one of the finest specimens of ancient street architecture now to be found, and it is much to be regretted that no attempts are made to keep it in good repair, of which it stands greatly in need. We mentioned it some time ago, when the British Archæological Association visited Coventry.

The only entrance to the building is from the street, by the doorway shewn in the illustration. This leads to a narrow open court, on each side of which are ranged the dwellings, affording accommodation for thirteen persons. The design and the detail of the fronts in the court are equally good, and present as much variety as in the more important street front. The whole of the detail is of the most delicate description, and it was a matter of much regret that we had not time to do more, during a couple of hours' stay in Coventry, than make a sketch of the principal front.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

On the 29th ult., Mr. Poynter, Vice President, in the chair, the committee appointed to examine the Cavalière Matas's design for a new façade to the church of S. Maria del Fiori, at Florence, brought up their report, which was received, and will probably be sent to Florence. The opinions which we have expressed on this subject were fully borne out by the report itself, and, for the credit of the Institute, the less we say of this latter the better. We find that there is positively one series of complimentary opinions on this project in print already, for circulation, "patent-medicine" fashion, and repeat distinctly what we have already said, that the design is altogether incommensurate with such a proceeding.

Mr. Tite read some discursive remarks on pointed architecture, communicated by Mr. Joseph Gwilt, and which are to form a chapter in the second edition of his "Encyclopædia." They embraced notices of the freemasons, masons' marks, symbolism, which the writer condemned as an idle affair, and general proportions. These he considered were arithmetical rather than geometrical, and that the figures 3, 5, and 7 regulated many of the mediæval buildings. He considered it unfortunate that so much attention is given at this time to the study of details rather than to the discovery of general principles, which were more deserving of attention, because, if the stem of the plant were right, the leaves and flowers were sure to come so.

Some drawings of mural distemper paintings in the church at Lingfield, in Surrey, were exhibited, consisting of separate figures, about two feet high. The whitewash having been removed last summer, in the course of repairs in one part of the church, the "commandments" were found written, and then, under this writing, the figures in question.

Lingfield church, built in the time of Henry the Sixth, and one of the most important churches in Surrey, being 116 feet long and 64 feet wide, has been recently restored at considerable expense,—the interior, if we may believe a correspondent on the subject, not very satisfactorily.

Mr. Farlar and the Late Westminster Sewers' Commission.—Mr. Farlar has forwarded us a copy of his letter to the late commission (mentioned in The Builder, page 572), protesting against the use of the rates for defending an action brought against Mrs. Webb (which action, he says, was simply for the purpose of pressing on the commission to carry out the Act obtained in July last), and requests us to print it. The fact, however, of our not having done so at the time, shews that we did not consider it desirable,—it is now even less so.

FORMS FOR DOMESTIC UTENSILS, OBTAINED FROM LEAVES.

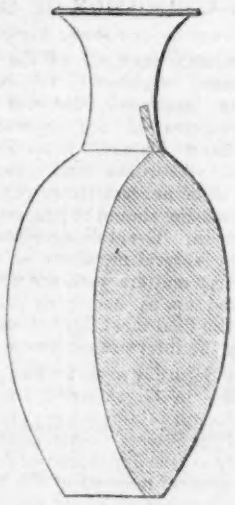


Fig. 1.

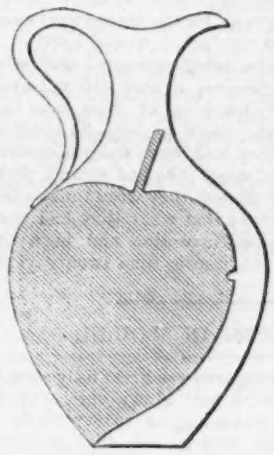


Fig. 2.

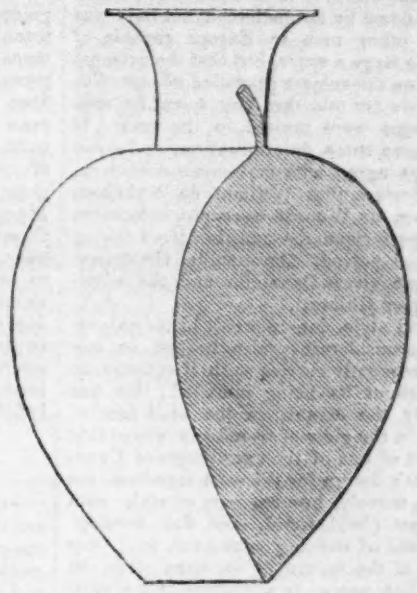


Fig. 3.

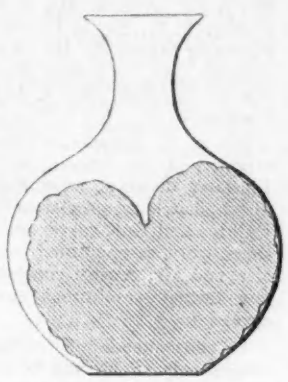


Fig. 4.

Fig. 5.

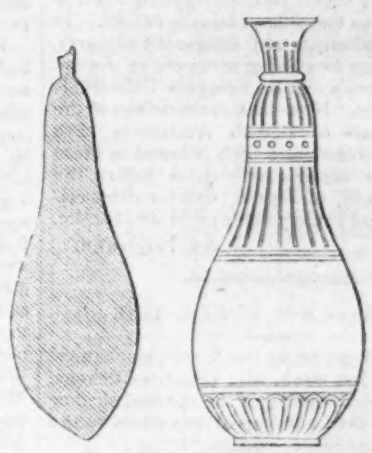


Fig. 6.

FORMS FOR DOMESTIC UTENSILS, OBTAINED FROM LEAVES.

In a paper on Art, read at the Decorative-Art Society by Mr. Dwyer, and reported in our pages,* the reader observed, that whatever is truly great or practically useful is always based on simplicity. He was of opinion that the outlines of Greek and Etruscan vases, which had caused much abstruse geometrical investigations into conic sections, had not been produced by geometry, and he then exhibited a series of tracings from the curved outlines of leaves, to shew how simply very refined forms are obtainable. Above we give some applications of the outlines thus obtained. Fig. 1 is from a laurel leaf, fig. 2 from an apple leaf, and fig. 3 from thornbeam. A geranium leaf produced fig. 4, a second leaf of the same kind giving the neck; and fig. 5 is from a leaf of privet.

THE DUOMO OF FLORENCE.

Sir,—Professor Donaldson's paper on the Duomo of Florence, read at the Royal Institute of British Architects, and reported *verbatim* in The Builder of the 27th ult., is so interesting a document, that I am induced to comment upon it as an example of the necessity of collateral research in professional pursuits after knowledge. When architects of no standing fall into a very usual negligence, the consequences are of little importance; but the fluency, zeal, and reputation of the worthy professor, and perhaps, above all, his blooming rhetoric, give charms to his communications which, like the florid decorations of latter Gothic edifices, serve to disguise errors of purpose and construction when they occur, and lead the unwary to a wrong appreciation of facts. He informs us, that the design of that edifice "is a bold departure from previous practice by the introduction of a large octagonal vestibule, flanked by three chapels, and surmounted by its enormous dome—a daring transition from established ideas to a new epoch." This is highly complimentary to Arnolfo's energy and talent. He adds, "On the death of Arnolfo, Giotto was appointed to continue the work, in which he seems to have followed most strictly the design of the original architect (Arnolfo), not only in the cathedral but in the campanile or bell-tower. * * * It is, of the kind, the most beautiful production of the art, a perfect gem in design and execution, graceful in form and profuse in marble." Mr. Donaldson further calls Arnolfo and Giotto, "lights in an age of artistic darkness."

Every student, and many others, who heard the professor, must have taken it for granted that Arnolfo was a great and exquisite architect, and that Giotto, from the hopelessness of excelling his productions, adopted them without any exercise of his own genius. But the tables are sadly turned on poor Arnolfo by the following summary charge of the worthy orator:—"In casting off the trammels of the rules of the fantastic style hitherto prevalent, and unacquainted with the severe refinements of classic art, * * he has produced an enormous but timid and flat development of surface, mechanical and tame, devoid of bold and striking sentiment, and with a total absence of those dignified and impressive modifications of outline, chiaroscuro, and advancing and receding planes, which form the charm as well of Gothic as of classic art."

I have, in this part of the inquiry as to the danger of giving way to the florid style, a few words to say on the epithet applied to Arnolfo and Giotto,—"lights in an age of artistic darkness." Artistic darkness, indeed! It is the very age of all that is most beautiful in Gothic, and of much that is exquisite in revived art;—the age of Edward the First. The cathedrals of Amiens and Salisbury, the Sainte Chapelle and Waltham Cross, the monuments in Westminster Abbey, of Henry the Third and of Edward's queen, Eleanor, are indications of the "artistic darkness" of that age. Nor must we forget that the sculptor of Edward's queen was the friend, assistant, and rival of Giotto. How can Cavallini and Gentile Fabriano be forgotten? In like manner the Pisanii, who preceded, and Taddeo Gaddi, as well as Pietro della Francesca, who immediately followed, must be rescued from "artistic darkness." In truth, the ages of darkness were gone: in 1230, Frederic the Second adopted knowledge from the Saracens and planted it in Italy, in spite of the church; he sowed the seed, and, after his defeat, the commercial republics, liberated from foreign dominion, reaped the harvest. Nor was it in Italy only that every branch, especially of mathematical science, was spreading. Alphonso, king of Castille, and the Polish Vitellio, were also brilliant contemporaries of Arnolfo; and the like must be said of our eminent countrymen John of Halifax (also called de Sacro Bosco), Friar Bacon, and Bishop Grothead. At the same

* See p. 539, ante.

time lived Petrarch, Boccacio, and other distinguished writers.

Instead of troubling you with further proofs of the inapplicability of this expression, allow me to question another leading surmise, viz., that from the death of Arnolfo until the building of the dome by Brunelleschi, not only was there no other man in Europe capable of vaulting so large a space, but that the grossest ignorance on the subject prevailed *all over Europe;* for we are told that the scientific men of all Europe were invited to the task. It would require some determination, and—you will perhaps agree with me—some consideration, to declare that William de Wykeham and William de Woorde were not competent to such a performance,—and they lived during the assigned period. And so did Brunelleschi's artistic rivals Donatello and the admirable sculptor Ghiberti.

The florid style does not suit historical research: inconsiderate praise heaped on one man too frequently carries with it censure on others, without its being intended; this was remarkably the case when the kind-hearted professor, in the glow of friendship, stated that the neglect of one of the excellences of Cavalière Matas's design for the west façade of the cathedral, namely, homogeneity of style with the original (bald, timid, and flat development, devoid of striking sentiment, &c.), was the cause of the failure of so many other designs. That, again, is a mistake, for several of those designs were approved, and only required, it would seem, one objection to be removed, and that objection—*expense*—is also an obstacle to Cavalière Matas's design. In science compliments are dangerous adjuncts, and to pass one to a living architect at the expense of Vignola and his compeer Palladio, is hardly prudent. Now that the members of the Royal Institute of British Architects have constituted themselves a high tribunal in these matters, their verdicts will come before the public, and will, of course, call for strict criticism.—I send you my name; and am, Sir, &c.

An Inquirer.

IGNORANCE IS POWER, TOO.

At a *soirée* given by the Leeds Mechanics' Institution, last week, Mr. Charles Dickens, who presided, speaking of the spectral shadow of a certain dead and buried opposition to the spread of knowledge, said,—

"Imagine here, on either hand, two great towns like Leeds, full of busy men, all of them feeling necessarily, and some of them heavily, the burdens and inequalities inseparable from civilised society. In this town there is ignorance dense and dark; in that town, education—the best of education; that which the grown man from day to day and year to year furnishes for himself and maintains for himself, and in right of which his education goes on all his life, instead of leaving off complacently just when he begins to live in the social system. Now, which of these two towns has a good man, or a good cause, reason to distrust and dread? 'The educated one,' does some timid politician, with a marvellously weak sight, say (as I have known such politicians say), 'because knowledge is power, and because it won't do to have too much power abroad.' Why, ladies and gentlemen, reflect whether ignorance be not power, and a very dreadful power. Look where we will, do we not find it powerful for every kind of wrong and evil?—powerful to take its enemies to its heart, and strike its best friends down—powerful to fill the prisons, the hospitals, and the graves—powerful for blind violence, prejudice, and error, in all their gloomy and destructive shapes? Whereas, the power of knowledge, if I understand it, is—to bear and forbear—to learn the path of duty, and to tread it—to engender that self-respect which does not stop at self, but cherishes the best respect for the best objects,—to turn an always enlarging acquaintance with the joys and sorrows, capabilities and imperfections of our race, to daily account in mildness of life and gentleness of construction, and humble efforts for the improvement, stone by stone, of the whole social fabric."

At the same meeting, Mr. George Stephenson said—"he commenced his career at a lower standing than any man that was present there that night. He made that observation for the purpose of encouraging the youthful mechanic to do as he had done—to persevere. And he could tell them that they occupied a most advantageous position,—they had had teachers who, going before them, had left them their great discoveries as a legacy and a guide, if they would take advantage of their teaching. But he remembered the time when there were none to guide and instruct the young mechanic. He knew that if they profited by the experience of those who had gone before them, they would be saved much trouble and annoyance, for the free interchange of ideas amongst mechanics would prevent a great deal of capital being expended uselessly. Many young mechanics, if they did not avail themselves of the teaching of those who had gone before them, would perhaps be induced to believe that they had made some discovery in mechanics, and when they had spent a great deal of time and money, they would make the unpleasant discovery that what they had considered an original invention had been put forth, it might be, more than twenty years before."

PROGRESS IN SLOUGH.

Sir,—The Sloughites are dreadfully slow to see improvements of any kind; they require the power of a steam-engine to set them in motion, but, when once moved, they go along at a railroad pace. They have just had such a power, even the power of the press, in the shape of The Builder, which is read in the mechanics' reading-room as regularly and thoroughly as the *Times*.

For several seasons past the gas question had been mooted, but received no encouragement. A committee was formed a few weeks since (in consequence of suggestions thrown out by a lecturer), to see how the affair might be arranged. They convened a public meeting, at which they procured the attendance of a gas engineer. The result was, a company was formed on the spot, with a capital of 2,500*l.*, in 250 shares of 10*l.* each. 155 shares were taken in the room: the remainder were disposed of the next day. A meeting of the shareholders took place on December 3rd, to receive the deposits, when the committee were authorised to enrol the society. The spot of ground was then fixed on, and Mr. T. Sharp, of Nottingham, was appointed engineer. The works are to be commenced in the spring, so as to have them ready for the next winter. Upwards of three miles of main will be required to reach the different streets. Thanks to The Builder for this great boon!

Subscriptions are still received towards the new church for the parish of Eton. The architect's estimate is 6,000*l.*

The alterations and restorations at Eton College Chapel are nearly completed. The temporary chapel, with its stained-glass windows, is advertised for sale by public auction. The bench ends are of poor design, and look very meagre. The roof, though well executed, appears very heavy. It is an open one, of oak, and is stained to an excessively dark shade. The featherings of the principal next the east wall interfere very greatly with the label and archivolt mouldings, and therefore have a bad effect.

The plan for establishing (or rather reviving) the general market at Slough, is unfortunately at a stand-still. As the greater part of the town is in the manor of Upton-cum-Chalvey, the mover of the scheme wrote to the lord of the manor, requesting aid: he declined sending cash, and "begged to warn the inhabitants from executing the works, as if they did he should take all the tolls, he having a patent for the same." The committee were thunderstruck, but, nevertheless, were determined not to be outdone, and decided upon erecting the market, &c. out of the manor, at the outskirts of the town. They, in consequence, entered into a treaty with a party (who owned the only suitable spot) for the purchase of about three-quarters of an acre, having a frontage of about 100 feet. After a length of time, an answer was obtained, and again they were baulked, the price required being 1,500*l.* They must now wait till a more favourable time.

It appears it is sixty-five years since any market was held at Slough, and about forty years since a fair was held; therefore the solicitor to the committee thought the lord of the manor had lost the right by desuetude, but as the lord of the manor was determined, and opposing him might lead to litigation, they thought it the wiser course to be out of his power. There was no lack of money, had other circumstances been favourable.

X. Y. Z.

NEW COMMISSION OF SEWERS.

The ordinary meeting of the Westminster Commission, appointed to be held on Friday in last week, did not take place, in consequence of the supersedeas issued by the Lord Chancellor on Tuesday, and, therefore, all works and payments were declared to be necessarily suspended until the new commission should be properly constituted and sworn in. Great disappointment was expressed by several members of the old commission that matters were not properly closed and wound up, as had been proposed to be done at the final meeting, but which was prevented by the interference above referred to.

Late on Saturday night notices were received at the office in Greek-street, from the Metropolitan Sanitary Commission, calling upon the officers of the Sewers' Commission to give their attendance at Gwydyr House on Monday morning, at a general meeting of the board. They accordingly attended, as did also the officers of the other metropolitan commissions of sewers. At 12 o'clock Lord Morpeth took the chair, when the following members took the usual oaths of office:—Lord Ebrington, Lord Ashley, Dr. Buckland, Mr. Hume, M.P., Hon. F. Byng, Dr. Arnott, Dr. S. Smith, Mr. R. A. Slaney, M.P., Sir J. Clark, Rev. W. Stone, Professor Owen, Sir H. De La Beche, Mr. J. Bidwell, Mr. J. Bullar, Mr. W. J. Broderip, Mr. R. L. Jones, Mr. J. Leslie, and Mr. E. Chadwick.

Mr. L. C. Hertslet, of the Westminster division, and Mr. Staples, of the Holborn and Finsbury division, were appointed clerks of those districts provisionally; and Messrs. Phillips and Roe, surveyors of the above divisions, were re-appointed surveyors provisionally, and Mr. Austin consulting-surveyor. A few formal resolutions were then put and agreed to.

In consequence of certain necessary arrangements to be made, it was considered impracticable to hold a court before the 16th instant, to which day this meeting stood adjourned.

The constitution of this new commission will require consideration. The great object of change should be improvement.

Improvement of Roads in Kentish Town.—An action has just been decided in the Court of Queen's Bench, as to the liability of certain houses, situated in Kentish Town, to be rated by the commissioners appointed under 4 & 5 Vict. c. 67, for its improvement. The Kentish Town Commissioners had made a pavement all the way from Camden Town to Highgate, a space of three miles, up to the line of road in question, which they repaired, widened, and provided with footways, where the owners or occupiers had neglected to do so. In some places the pavement had to be widened about four feet, by going on the carriage-road, which, under 57 Geo. 3, was placed under the jurisdiction of the metropolitan commissioners, whose consent was obtained. This improvement involved an extension of the footway in a part of Southampton-terrace, from three feet, which it originally was, to seven feet; and it was the expense incurred in this addition of four feet in width, that formed the matter in dispute. The defendants contended that they were not liable, inasmuch as the footway was not that next or adjoining the frontage of their houses, that the money was not laid out on the three-feet footway in existence on the passing of the Act, or that it ought at all events to be shewn that it *was* laid out upon the footway *three feet wide*. Their lordships gave judgment in favour of the Crown, on the ground that the footway in question was one that must be considered to come within the meaning of the Act, and over which the commissioners for the improvement of Kentish Town had full and complete control.

EXPERIMENTS ON THE FORM OF CAST-IRON GIRDERS.

Sir,—The following experiments are submitted, as laying before you, in a very simple form, first, the proportionate values or strengths of the simplest forms of cast-iron beams, as applicable to constructive purposes; and, secondly, the positive value of the application of the wrought-iron tension-bar or rod to the same, as a means of adding increased value in strength; and that the investigation is at this moment imperatively called for, the experience of the last few months witnesses.

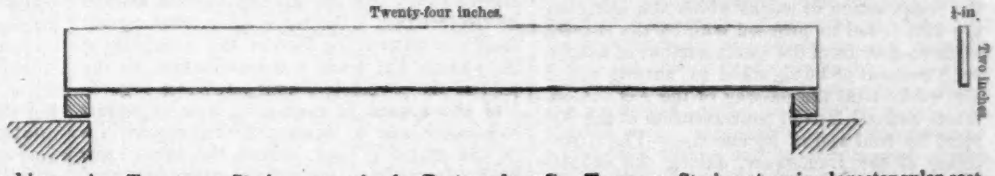
It appears a little singular that the use of the tension-bar, as a means of adding strength to the bearing purposes of cast-iron, should have so largely obtained without the same having been based upon actual experiment, and, still more strange, that it should almost invariably have been used in such a position, that its presence not only adds nothing to the security sought, but that its application has really been one of the elements of destruction to the beam to which it has been so attached (as see experiments to be given in a following paper).

That the application of a superior tensile material, as wrought-iron undeniably is, to cast-iron for structural purposes, and especially in combination with cast-iron as *its* superior to resist compression, is a proper subject for earnest research, and a desideratum to a large and extensive interest, is without doubt; and that such an investigation yet remains to be performed, is also true. Such an inquiry should, in my opinion, be pursued by actual experiment, based upon the dissimilar properties of the two materials; the one superior to the other for its tenacity, to be reserved only to that use, whilst the other, again *its* superior in the facility with which it admits of being put in preferable forms to resist compression, to be reserved to that purpose only. This, I believe, is the present question, and one of more real moment to the public, when seriously reflected upon, I scarcely know; for, when contemplating the existing lines of communication into which the combination of the two materials has entered so largely in their various structures, the consequences of failure in any of them is seen to be terrific.

In briefly noticing the accompanying experiments, the first portion relates wholly to the simplest forms in which cast-iron can be used as bearing beams, and as leading on to the perfecting our knowledge of the value of the various useful forms of which it is susceptible. The results there manifest will bear reiteration. 1st, *Experiments A* are commenced as a foundation, the bars bearing 482 times their own weight, with a deflection one-thirteenth of their depth. 2ndly, in *Experiments B*, notice the breadth and consequent quantity of material doubled, producing but 1¾ the strength, its stiffness or deflection remaining only the same, bearing but 403 times its own weight, or a loss of 12 per cent. This is a point, in the proper disposition of materials, often of much importance, and, as a caution, needs to be prominently put forward, for the mind is but too apt to recognize without exception the product of two and two to be four. Its stiffness, also remark, remains identical with experiments A, notwithstanding the large increase of material, the length and depth being still the same.

Experiments C afford a further illustration of the same result, the quantity remaining similar or rather increased,—though the beam consists of separate pieces, nothing better is arrived at,—we still witness the diminution of strength: although a small gain in stiffness or lesser deflection is produced, this may be accounted for by the fact of their being in distinct castings. Each has its separate surface or skin, which is in a measure chilled or stiffened in its cooling from the melted state. It increases the value of stiffness but not of ultimate strength. It was also remarked, during the progress of each of the three experiments C, that the beam appeared to lie under disadvantage peculiar to itself. Supposing two beams in practice similar to those now under consideration, it would be practically impossible to produce the two in all parts alike as to weight, scantling, and perfection of body, surface, and quality of material. Reasoning, then, that one of the two would be the weaker, does not *that* weakest, by its yielding first to the force acting upon it according to its own strength, involve, by its such destruction, the destruction also of its fellow, and so produce but a double strength of the weakest, instead of a combined strength of the two? If so,—and it appears but reasonable so to argue,—how fully does it point to the necessity of exceeding carefulness of supervision, where, as in large structures, generally dependent one part on another, one part in its failure involves such extensive ruin!

Experiments D.—These three experiments entering into a comparison with either B or C, bear undoubtedly high upon the question of the best disposition of the material, recollecting, at the same time, we are not advocating a section or attempting to produce in this inquiry the best of all sections for practical purposes, but merely instituting comparisons with a determinate quantity of material. It is remarkable here to witness the great increase of strength, although not accompanied by stiffness,—the gain in strength being 25 per cent. upon experiment A: the loss in stiffness being 30 per cent. The strength arising from the accumulation of the quantity submitted to tensile action bears out an adequate result, or 580 times its own weight, instead of 400, as B and C, shewing over them an increase of strength of nearly 50 per cent. In using this section, it makes no difference whether the load be placed wholly upon the upper part of the vertical web or whether it be placed upon the *lower* flanches or webs, the result obtained in either case was the same. This form of section in this series of experiments, it will be seen, is much to be preferred to any other (even inclusive of the following, viz., those which were trussed by the addition of the wrought-iron bolt), and it, as a basis for further consideration of the best form, deserves attention, and perhaps, for practical purposes, it may, on account of its simplicity, as being more readily borne in mind, be preferred to a more complex and better studied form.



A.—Transverse Strain on a simple Rectangular Iron Beam, 24 in. long, 2 in. high, and ¼ in. thick.

The pressure of the lever and scale in all these experiments was 220 lbs.
The pressure of the lever and weights were severally as under.

No. 1 Experiment. Weight, 53½ oz.		No. 2 Experiment. Weight, 54 oz.		No. 3 Experiment. Weight, 55 oz.		No. 4 Experiment. Weight, 56 oz.	
Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.
520	·06	520	·04	520	·061	520	·04
580	·067	580	·046	592	·068	580	·044
652	·074	652	·052	652	·074	652	·051
712	·080	712	·057	721	·082	724	·058
784	·087	784	·064	805	·089	787	·063
864	·097	868	·071	868	·097	856	·068
903	·104	937	·078	931	·103	919	·073
993	·110	1000	·083	991	·109	979	·079
1056	·117	1060	·089	1060	·115	1039	·084
1128	·123	1132	·096	1132	·122	1108	·089
1188	·129	1195	·103	1180	·127	1180	·095
1242	·135	1249	·108	1252	·133	1252	·101
1311	·142	1321	·115	1321	·138	1315	·109
1371	·148	1384	·121	1381	·144	1375	·113
1437	·156	1447	·128	1453	·149	1435	·117
1506	·162	1510	·134	1513	·154	1498	·123
1566	·169			1576	·16	1552	·128
1635	·179					1621	·134
						1693	·138-9
						1777	·148

Two minutes elapsed between the weightings in the whole.

B.—Transverse Strain on a simple Rectangular Cast-iron Beam, double the width of A. All else relating to it similar.

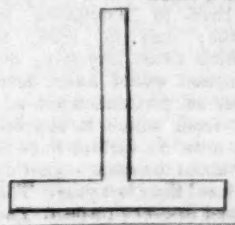
No. 5 Experiment. Weight, 106 oz.		No. 6 Experiment. Weight, 108½ oz.		No. 7 Experiment. Weight, 110½ oz.		No. 8 Experiment. Weight, 112 oz.	
Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.
820	·052	820	·043	820	·037	820	·037
928	·057	961	·051	963	·045	955	·047
1072	·065	1099	·057	1083	·052	1099	·055
1195	·072	1246	·064	1215	·06	1231	·062
1321	·078	1390	·071	1347	·067	1363	·069
1465	·085	1528	·077	1488	·073	1483	·074
1591	·093	1660	·085	1608	·08	1651	·084
1735	·099	1786	·091	1785	·09	1783	·091
1861	·106	1930	·098	1893	·097	1942	·1
1981	·113	2074	·107	2001	·103	2083	·107
2149	·120	2206	·116	2124	·11	2206	·116
2287	·127	2338	·124	2250	·118	2359	·123
2425	·135			2388	·127	2503	·133
2573	·142			2520	·135	2629	·141-2
2705	·149			2664	·145	2767	·15
2831	·154			2802	·156		
2969	·160						
3113	·173						

Two minutes elapsed between the weightings in the whole.

C.—Transverse Strain on two simple rectangular cast-iron beams, each similar to A, and placed side by side half an inch apart. All else relating, similar.

No. 9 Experiment. Weight of 1·55 } oz. 1·56 } 110		No. 10 Experiment. Weight of 1·55½ } oz. 1·56½ } 112		No. 11 Experiment. Weight of 1·56 } oz. 1·99½ } 113½		No. 12 Experiment. Weight of 1·57¼ } oz. 1·57 } 114½	
Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.	Pres. in lbs.	Deflection.
820	·057	820	·047	820	·044	820	·042
952	·062	943	·053	940	·05	952	·048
1096	·067	1075	·061	1066	·058	1081	·054
1222	·072	1207	·066	1222	·066	1210	·061*
1363	·077	1339	·071	1345	·07	1345	·067
1471	·082	1486	·078	1474	·077	1477	·074
1591	·087	1618	·085	1612	·085*	1606	·08
1735	·094	1741	·09	1732	·089	1747	·087
1855	·1	1883	·097	1879	·127†	1876	·093
1999	·107	2015	·103	2017	·133	2023	·1
2119	·112	A small air-hole.		2155	·138	2148	·107
2245	·117			2293	·144	2280	·115
2371	·123			2425	·149	2418	·121
2515	·129			2569	·154	2556	·127
2647	·135			2689	·158	2700	·133
2803	·141			2821	·162		

Both beams broken at once. They were cast from one runner and flowed through at the extreme end.



D.—Transverse Strain on a Cast-Iron Beam, the Section formed of one Rectangle placed centrally upon another and at right angles to it.—Scantlings, and all else relating thereto, similar to C.

No. 13 Experiment. Weight, 111 oz.		No. 14 Experiment. Weight, 111½ oz.		No. 15 Experiment. Weight, 112½ oz.	
Pressure in lbs.	Deflection.	Pressure in lbs.	Deflection.	Pressure in lbs.	Deflection.
820	·035	820	·037	820	·025
949	·043	955	·042	958	·03
1187	·05	1102	·049	1087	·037
1328	·057	1246	·056	1243	·043
1448	·063	1369	·063	1381	·05
1607	·07	1501	·07	1513	·056
1727	·078	1636	·077	1660	·063
1868	·084	1771	·082	1816	·07
1994	·091	1915	·09	1918	·076
2150	·099	2011	·096	2062	·083
2282	·106	2143	·103	2194	·09
2411	·113	2281	·11	2338	·097
2543	·120	2422	·117	2445	·103
2669‡	·127	2560	·124-6-7	2587	·11
2801	·134	2692	·132	2719	·117
2933	·142	2830	·14	2851	·123
3065	·15	2998	·151	2995	·131
3200	·158	3148	·160-1	3145	·138-140
3344	·167	3286	·170-1	3325	·15-1
3524	·177-9	3412	·178-18	3457	·157-8
3668	·187	3550	·187-9-19	3589	·165
3800	·195	3682	·197-201	3733	·174
3938	·204	3814	·208-9-213	3865	·18
4076	·214-9	3952	·220-223	4003	·184
4102	·226	4090	·232		

* A crack.
† Weights relieved on account of cast-iron bearing-piece breaking. Replaced by a wrought-iron piece.
‡ A crack like grain tin. § Broke, a small air bubble.

Drury-lane. George B. Cooper.

RAILWAY JOTTINGS.

The Government Railway Bill is more intelligible than such documents generally are. The chief provisions are, that companies wishing for an extension of time must make application to the Commissioners of Railways within two months from the passing of the Act. The commissioners may then, if they think fit, extend the time, but not for more than two years from the expiration of the period allowed by the original Act. The claims of parties aggrieved by the delay, if not settled by agreement with the company, shall be settled by arbitration or a jury, as by the Lands Clauses Consolidation Act. It is also enacted that no railway company which had not before November 27th, 1847, entered into any contract for the execution of works authorised by their Act, shall now enter into any contract within twelve months after the passing of the present Act, except in cases of deviation from the line originally proposed, and contracts for the construction of works which the company are authorised to proceed with by the consent of three-fourths of the whole number of shares, such consent to be signified in writing within six weeks after the passing of the Act. Contracts entered into in contravention of the Act shall be void and of no effect.——The Chancellor of the Exchequer, during the debates on the passing of this Act, and while deprecating the too rapid conversion of floating capital into fixed capital, as the chief cause of the mercantile and manufacturing distress,—a cause foreseen by Mr. Porter, at the end of 1845,—adduced several figures to show the rapid increase in the amounts annually devoted to expenditure on the construction of railways. From 1826 to 1835, Parliament authorised the raising of about 19,000,000*l.*; in 1836 and 1837, 36,000,000*l.* Distress then checked railway speculation. In 1844 and 1845, Parliament authorised the raising of 74,000,000*l.* In 1846, 800 plans for railways were submitted to the Railway Board, and Parliament authorised 132,000,000*l.* The total expenditure authorised between 1826 and 1846 was 286,000,000*l.*; by far the greater portion being sanctioned in the last three years. The Railway Commissioners state the actual expenditure to have been,—In 1841, 1,470,000*l.*; in 1842, 1843, and 1844, gradually increased to 6,105,000*l.*; in 1845, about 14,000,000*l.*; in 1846, upwards of 30,000,000*l.*; and in the first half of 1847 alone 25,770,000*l.* "If the works had gone on at the same rate," added Sir Charles, "the expenditure would have amounted in this year to 64,000,000*l.*; in 1848, to 70,000,000*l.*; in 1849, to 47,000,000*l.*; and in 1850, to 10,000,000*l.*; by which time, probably, the works already authorised would have been finished.——A number of particulars are adduced by *Herapath*, from which it appears that the receipts per mile on various lines in the present year are 'about the same—possibly on the whole a little less' than last year. The Midland have increased in every respect. The Great Western are about the same, but when the reduction in fares to the same standard as the London and North-Western comes into operation, and their parallel lines commence working, they may possibly be less, he thinks, to some extent;—possibly they may, but probably they may not. It must be recollected, in estimating the receipts per mile, on various lines, that there have been long branch lines opened, which, while they receive less per mile, have cost less in construction; so that a reduction of receipts per mile must not be taken to indicate a proportionate reduction of profit.—— A Mr. A. C. Pirani intends, it is said, to bring forward an invention for lighting railway and other carriages with gas, to be conveyed through glass pipes so contrived that they can be removed at pleasure. A cheerful and brilliant substitute for the glimmering light now in use in railway carriages, and one at one-third the cost, too, would certainly be a boon next perhaps to comfortable warmth, in the winter season, and might be made indeed to aid in also warming the carriages which it lights,—a hint which, we hope, the inventor will adopt and benefit by, as well as benefit the travelling public, who much require the suggestion of some such economical mode of killing two birds with one stone to be pertinaciously thrust by inventors on the callous notice of railway directors, who have hitherto been as cold to every melting appeal, even from the frozen lips of their favourite first-class traffic, as John Frost himself.——The latter gentleman, by the way, has already begun his winter's work as a contractor on the atmospheric lines, to which he still seems regularly to supply the place of pitch or other solder to the valves,—but rather too officiously. The question, as lately observed in the *Mining Journal*,—itself an advocate of the general principle of the atmospheric system,—is still a question of valve. Could not some modification or other of the plan for opening and sealing the valve by heated iron and pitch, as the train passes along, be applied to the frost or ice itself, so as to turn John's willing services to useful account?—— Meantime the elastic steel tube system, a working model of which was lately laid down near the Poplar station of the Blackwall Railway, is still endeavouring to make way in the place of that whose practical continuance each successive winter seems to defy. The working-model alluded to, however, at length altogether disappeared; but the *Mining Journal* assures its readers that "the tubes were taken up not from any mistrust or fear of the capability of the system, but from a determination, on the part of the proprietors and patentees, regardless of expense, to render the tube as perfect as possible, and to develop the full capabilities of the system;" and, indeed, the tubes have been relaid, after being a little further advanced towards the perfect state by the addition of new corrugated copper joints, introduced by the patentees, Messrs. Clarke and Varley, in order to "allow for any degree of expansion and contraction, and supersede the employment of every description of leather, gutta percha, or other perishable or objectionable substance." Satisfactory experiments are said to have been since tried with the new apparatus. We have not lately heard any more about Messrs. Cunningham and Carter's ingenious scheme for getting rid of the slit valve altogether, and for turning on the atmospheric or pneumatic power or vacuum through a copper main with branches. Many are still hopeful that the atmospheric system, "when carried out with well-constructed mechanism, is the only means of escape from the enormous expenses and the imminent danger of the present general system, and, in fact, which are inherent in it."——The Lambeth vestry had a meeting lately in order to adopt measures which should put a stop to the erection of a bridge, by the South-Western Company, over Church-street, right in the centre of the carriage way of which the pier would stand, dividing the road into two parts. In proposing the first resolution, Mr. Hicks adverted to the fact of the road being one of the finest in the parish, and of its being included in the Government scheme of metropolitan improvements as the approach to the contemplated bridge over the Thames. The carriage way was originally 38 feet wide, but it was now divided by a pier, on one side of which the carriage way was 16 feet, and on the other 18 feet 5 inches. By the Act of the company they were compelled to cross the road with an arch 60 feet span; and by the Railway Clauses Consolidation Act every turnpike road crossed was to be crossed at a span of not less than 35 feet. This was a turnpike road at the time of the passing of the Act. It would be very easy to cross the road by a single span arch, supported on pillars, leaving smaller arches for the footways, as at Bermondsey-street. For the board of surveyors it was stated, that they had given no definite consent to the plan, which, however, appeared to them to be the best proposed. When they spoke of crossing the road at a single span, Mr. Locke, the engineer to the company, said that he would not answer for the safety of passengers travelling over such an arch, especially after the experience they had lately had in reference to iron bridges. The company had built the piers of the bridge, and had all the cast-iron frames ready.—It was at length determined to try the effect of pacific measures at first, and a committee was appointed to act accordingly.

A Lucky Discovery.—Among a collection of paintings, the property of Mr. John Wilson, of Stratford, he has discovered "A Sleeping Venus," executed by Titian. We understand the fortunate owner has sold it within the last few days for five hundred guineas.—*Chelmsford Chronicle.*

SLATES.

The best slates, Professor Ansted said in one of the lectures to which we have already referred, were those which were most crystalline, and which, when breathed upon, gave out the faintest argillaceous odour. When this odour was given out strongly, then the slates would readily decompose, and, consequently, these were not so well fitted for economic purposes. In many instances, the appearance of slate at the surface indicated that it had undergone a change, apparently produced by violence, as it had become broken, and in that form it was very readily decomposable, and, of course, very bad; yet, on digging down to the deeper beds, a good material would very often be found. The colour of the slate was not of much importance; it was generally either blue or green, and very excellent slates were common to both colours. The extent to which slate was quarried was considerable, though it was in the hands of a very few individual proprietors, or small companies. It might be thence supposed, that a larger quantity would be obtained, and the price consequently reduced, if there were more competition; but a little consideration would show, that competition would be any thing but easy. For instance, a landed proprietor might have on his estate a slate of the very best quality; but if it were only nine or ten miles from the sea, with no very easy means of conveyance, it might be a losing speculation to quarry it, because the most material part of the cost was the carriage, and the quarries already established possessed every advantage of that kind. Thus, in estimating the value of property of this nature, it was highly important to remember what were the means of conveyance. Another consideration arose out of the large per centage of loss in the present mode of getting slate. This was of no consequence, in one sense, as the material was enormously abundant, but it became of vital importance when there were no means of disposing of the rubbish. The large quarries at Penrhyn were worked in successive terraces, and the slate being obtained in immense masses, by blasting, the waste was enormous, but it was got rid of without much inconvenience. The Balahulish quarries, in the north of Scotland, were also very extensive, between 5,000,000 and 7,000,000 roofing slates being there quarried annually. The weight of this number would probably be about 10,000 tons, and the quantity of rubbish being generally five or six times as much as the slates, 50,000 or 60,000 tons of refuse would thus have to be disposed of. In this case, however, it was thrown directly into the sea; and the quarry, in that respect, possessed an advantage which made it far more valuable than better beds lying further inland. Property of this kind was exceedingly valuable; the quarries at Penrhyn, for instance, had been variously estimated at from 30,000*l.* to 40,000*l.* a year.

NOTES IN THE PROVINCES.

The new church at Staplefield-common, Sussex, consecrated on Saturday week, is in the early English style. It consists of a nave, the only part for the congregation, with seats for about 350 persons, mostly free. The building cost about 2,000*l.*, principally subscriptions. ——The erection of a new chancel at Newchurch Church has been sanctioned, by the Bishop of Winchester, with a liberal donation. ——The public baths at Colchester, designed by Mr. Penrice, architect, are nearly completed.——Braintree Church appears to be going to wreck for want of repairs, the rates or rents due to the church out of parish property being withheld, in many cases, by the tenants or holders of the property.——It is intended to erect a church at Prickwillow, parish of Ely Trinity. The dissenters have already erected three chapels there,—one Baptist, one Wesleyan, and the other Primitive Methodist.——The church for the new district of St. Mark's, Wolverhampton, tenders for the erection of which were advertised in last week's Builder, is to accommodate about 1,200 persons, and to consist of chancel, 25 ft. + 20 ft.; nave, 84 ft. +27 ft.; north and south aisles, 84 ft. + 16 ft. 6 in.; height to wall plate, 31 ft.; to ridge piece, 52 ft.; tower and spire, 154 ft. high, with vestry and

north and south porches. Money has been raised by subscriptions, and grants have been promised from the Diocesan and Incorporated Church Building Societies. A parsonage-house in course of time, and also schools, ultimately are contemplated. Mr. Chas. Wyatt Orford is the architect.——The 'Gospel Elm' at Stratford-on-Avon having been cut down as a rotten stump which only 'cumbered the ground,' was found when too late to be perfectly fresh and sound at the core, and beautifully grained, particularly towards the crown, with scarcely a flaw. The whole was divided into lots, and produced 23*l.* 13*s.*, which will no doubt be multiplied to some profit when converted into articles of furniture and other memorials of the past, as a last consolation to those who lament its untimely end.——The public baths erected at Westbromwich at the expense of the Earl of Dartmouth, consist of four private apartments, with dwelling-house for the bath-master.——A new Roman Catholic church and schools are to be erected at the north end of Liverpool, as the most fitting monument to the memory of those worthy Catholic clergymen [nine or ten, if not more in number, if we rightly remember], who have sacrificed their lives as successive victims to fever in the discharge of their duties to the poor.——A spire, we hear, is to be added to Misterton Church, Trentside, which is now undergoing extensive alterations and repairs.——The improvements and restorations recently effected in the chancel of the parish church at Doncaster, are said to be satisfactory. Every portion of the chancel, says the local *Gazette*, is now visible at one glance; the piers shoot upward, free from the unsightly obstacles which previously stunted them; the communion table is rendered more free from incumbrance; and the eastern window assumes a more imposing and impressive character. No doubt the lovers of sacred architecture would be further gratified if the same taste, which has forcibly shewn itself with regard to the chancel, was rendered further manifest in the nave, side aisles, and transepts. This might be accomplished by cutting down the whole of the pews to a yard in height; removing, at the same time, all green baize and coloured cloth, —a custom which, with regard to lining pews, is more honoured in the breach than in the observance. The full extent of improvement, however, cannot be effected until all the unsightly galleries are cleared away.——A memorial is being signed at Gateshead, for presentation to the town council, praying that body to carry into effect the Baths and Washhouses Act, for the passing of which the inhabitants themselves petitioned.——The iron masters, both in Lanarkshire and Ayrshire, have resolved upon further reducing the wages of their workmen.

New Books.

Elements of Geometry. By J. D. London: Longman and Longmans, 1847.

ELEMENTS of Geometry, indeed! it would puzzle a *Cantab* to tell for what purpose this book has been written; does "J. D." know that the Elements of Euclid are still in existence? or does he know that there are many other elements of geometry, and some of them very unelementary? "J. D." must certainly have mistaken his object, or this emanation of his brain would never have seen the light. But what grieves us most is to see the highly respectable firm of Longman and Longmans superadded as the publishers of this, the very worst attempt that has ever been made at the composition of geometrical elements.

Railway Locomotion and Steam Navigation, their Principles and Practice. By JOHN CURR, of New South Wales. London: John Williams and Co., 1847.

THIS is certainly one of the most impertinent and worthless books that ever was written. The author, with matchless effrontery, calls in question the qualifications of our mathematicians and engineers, and considers them nothing better than a squad of ninnyhammers; but, John Curr, do not snarl so boldly, for we can assure you that there is in England a mathematician who can tell how many cow tails will reach to the moon, and a very simple affair he makes of it, for he says that one will do it, if it be long enough! We have an engineer in England who has made a double pathway and reared a range of arches under the belly of old Father Thames; there is another, who has formed the bold scheme of suspending an aerial tunnel over the Menai Straits; there is another, who has made the cliffs of Dover topple into the sea like snow from a house side, and would think it no great achievement to place the rock of Gibraltar on the other side of the strait. We have engineers in England who have put London and Edinburgh cheek-by-jowl; there are others who propose to join the Atlantic and Pacific Oceans, and also the Red and Mediterranean Seas; and last, but not least, there are others who propose to bore a hole through the Alps. All this and much more they have done, and propose to do. And yet,—Oh, John Curr! John Curr, oh!

Correspondence.

CAST-IRON GIRDERS.

SIR,—Your correspondent, "A Lover of Mechanics" (No. 250), states that a "girder, 18 feet long, 1 foot deep, weighing 10 cwt., and (*is*) only equal to bear a load of 10 cwt." With your leave, we may test the accuracy of this assertion. 10 cwt. is equal to 17,920 oz.; this, divided by 4·165 oz., the weight of a cubic inch of cast-iron, will give 4,302·521 cubic inches; divide this quotient by 234, the number of lineal inches in girder (18 feet = 216 inches × 18 inches for bearings), and we have 18·386 inches as the area of section. This metal for a girder, 12 inches deep, may be disposed as follows:—top flange, 2 inches; bottom flange, 6 inches; body, 10 inches; and angles, ·386 inches,—equal, 18·386 inches of section.

The formula of Mr. E. Hodgkinson will give us:—$(12^3 \times 6) - (11^3 \times 5) \div (18 \times 12)$ equal $(10368 - 6655) \div 216 = 17{\cdot}19 - \frac{1}{4}$ of this will give 11·46 tons, the ultimate strength of girder. If "A Lover of Mechanics" will, on the principle of the *balance*, reconcile this result with his "10 cwt.," I shall be glad to admit that his "suggestion may (*ultimately*) lead to some improvement in the construction of bridges."—I am, Sir, &c.,

Nov. 29, 1847. J. M. MCCULLOCH.

Miscellanea.

SHAKSPEARE'S HOUSE.—A magnificent audience filled Covent Garden Opera House, kindly granted by Mr. Beale, on Tuesday night, to witness such an exhibition of dramatic talent as has never before been seen in one evening. The proceeds will materially lessen the responsibility of the committee who have purchased Shakspeare's house; but 500*l.* are still needed to complete the arrangement. The prologue, written by Mr. Chas. Knight, and not recited in consequence of a slight disturbance raised by some who thought the pit had been *curtailed* too much, opens with this charming allusion:—

"The Macedonian stood within the gates
Of the devoted Thebes. Relentless hates
Ask'd to be loos'd in bloodshed and in fire:
Spare not—the conqueror cried:—Yet stay! the lyre
Of glorious Pindarus in Thebes was strung—
Search for his House these fated piles among;
Perish the city, down with every tower,
But save, from ruin save the Muses' sacred bower.

"The victor Time has stood on Avon's side
To doom the fall of many a home of pride;
Rapine o'er Evesham's gilded fame has strode,
And gorgeous Kenilworth has paved the road:
But Time has gently laid his withering hands
On one frail House—the House of Shakspeare stands;
Centuries are gone—fallen 'the cloud-capp'd towers;'
But Shakspeare's home, his boyhood's home is ours."

LARGE RAILWAY GIRDERS.—Within the last few days some interest has been excited at Witham by the arrival of some very large sized cast-iron girders, for two of the bridges on the line. These girders, which were cast at Derby, are said to be the largest single girders which have ever been cast, with one exception; they are fifty-three feet four inches and a half in length, and weigh about thirteen tons each.

OXFORD ARCHITECTURAL SOCIETY.—At a meeting on the 17th ult. the report of the committee was read by the secretary; it alluded to the progress made in the work of restoration at Dorchester Abbey Church, and mentioned that the altar is the gift of an unknown benefactor, and that the good effect of the chancel has been much enhanced by the offering of some hangings to serve as a reredos, and that the restoration of the east window is now complete. The committee expressed a hope that the elevation of the chancel roof further to the westward would not be prevented by the want of the necessary funds. The report next directed the attention of members to the proposed restoration and the colouring in the sacrarium of Swincomb Church, Oxfordshire, and concluded by recapitulating to members the rules to be observed in the election of a president and members to serve on the committee. A communication was then read by the secretary from the Rev. C. Pearson, corresponding secretary, describing nine churches in Herefordshire, in the neighbourhood of Knebworth. The question of the best mode of warming churches was then brought before the society by the president. The Rev. W. Sewell stated some of the objections which can be urged against warming by stoves; he alluded to the irregularity of the temperature which they diffuse, and to the danger of fire which they are found to involve, and was anxious for information on the use of braziers. The president observed that the best mode of warming churches was an important practical question of some difficulty. He mentioned the disadvantages attending the use of charcoal in braziers, especially the dust which they permit to escape. The Rev. T. Chamberlain spoke favourably of the result, in St. Thomas's parish church, of the introduction of movable stoves, nearly on the Ecclesiological Society's plan. They are intended for coke. The Rev. J. L. Patterson suggested that an arched wire covering might repress a good deal of the dust, that in some churches openings might be made in the floor in a style appropriate to the encaustic tiles, and underground pipes might be introduced, but that an objection to this mode of conveying heat is, that it can only be introduced with advantage into new churches, and entails much expense. Mr. Patterson mentioned the success which had attended the introduction of braziers into two churches with which he was acquainted. Mr. F. Meyrick, of Trinity College, was anxious to learn whether it would not be possible to make chimneys ornamental. The president mentioned the introduction of an ornamental chimney into Merton College, and of a pinnacle at Abingdon pierced to admit of the escape of smoke.

CAMBRIDGE ANTIQUARIAN SOCIETY.—At a meeting of the Cambridge Antiquarian Society last week, Professor Willis made some remarks on a clock, found in an old house near Royston, but now in the museum of the society, for which it had been purchased by the private subscriptions of a few of the members. He considered it to have been made in the time of Henry VIII., but not in England. The works having an escapement and pendulum, could not be of that date, since a pendulum is believed to have been first applied to clocks in the year 1678. The case is in the form of a tower, with corner pinnacles. The parapet of the sides is ornamented with what is termed flamboyant tracery, formed of "pierced work." On each side of the face is a pile of buttresses, supporting an ogee arch, inclosing the clock-face, the space between which and the arch is filled up by a mass of most beautiful "stumped" tracery. As stumped tracery was not used in England or France, the professor supposed the clock was made in Germany, probably at Nuremburg. He dates it at about the year 1500. He remarked that this case, being ornamented with true Gothic mouldings, arches, and pinnacles, disproved Mr. Pugin's statement,—that architectural forms were not to be applied to small domestic objects.

DRAWING-ROOM DECORATION.—In India the plastered walls of rooms are stamped when moist, and worked into patterns, over which is spread a varnish of powdered talc, which closely resembles the richness and hue of new and unused frosted silver plate. This might be introduced into England, as a very cheap and elegant drawing-room decoration.—*Patent Journal.*

MINUTES AND REPORTS ON EDUCATION.—The Committee of Council on Education have just issued, in a printed form, a mass of valuable documents on the subject of education, comprising minutes of council and reports of inspectors and others, the most voluminous of the latter of which are the reports of Mr. Joseph Fletcher, her Majesty's Inspector of Schools, on day schools throughout England and Wales, under the British and Foreign School Society's system, and on their normal and model schools in the Borough-road. These reports contain an immense mass of condensed tabular and other detail, and together with the accompanying reports, by Mr. John Gordon, her Majesty's Inspector of Schools in Scotland, and various others, appear to be replete with general interest and practical instruction both to teachers, Government, and the public generally. The reality of various already pretty correctly anticipated results, appear to be fully established by these reports, such as that there is the greatest deficiency of schools where they are most wanted; that there is a necessity for higher education under new circumstances; since there is an augmentation of crime in spite of augmented schooling of the common order; but that there is a slow decline of ignorance under the operation of the better order of schools as even at present constituted. Some of the details on the dark side of the picture of our present state of society are certainly startling—almost incredible, indeed, as facts of the nineteenth century in the heart of England, or even any where else than amongst the less decent order of savages—in illustration of which we may just refer to Mr. Watkins's "Report on Lancashire," vol. i., p. 441. The second volume contains a ground plan of the normal schools in Borough-road, and plans of the internal arrangement of British schools in towns and villages throughout the country. There are also in Mr. Moseley's reports (vol. i.), details of the council's Battersea Training Institution for Masters, and of the cognate institution, St. Mark's College, Chelsea, the enlargement of both of which is strongly recommended to the Committee of Council on Education.

HISTORY OF THE ELECTRIC TELEGRAPH.—SIR: In your review of "The Electric Telegraph," by Peter Progress, in THE BUILDER of the 13th ult., you mention (I suppose from that work), that a Mr. Rowland had "clearly established the fact, that an electric current might be made to pass through a continuous wire of great length." That fact was established about 100 years ago. All the electric telegraphs are merely varied applications of it. The only real inventions are probably the application of it to printing at a distance, and the applying it by one wire to many stations. Heighton's application of the gold-leaf electrometer, instead of the magnetic needle, can scarcely be called an invention; and the one-wired telegraph used at Baden-Baden appears to be that of Brett and Little, at whose telegraphic exhibition in Furnival's Inn I met him in August. The fact of the transmission of the electric current to great distances, was proved by Dr. Watson and friends on the 14th of July, 1747. They conveyed the shock across the Thames at Westminster on the 14th of August; they conveyed it a circuit of four miles, two of water and two of dry ground; its velocity was so great that no time appeared to elapse during its passage. W. CHAPMAN.

Leicester.

CAMBRIDGE ARCHITECTURAL SOCIETY.—At a general meeting held on the 25th ult., the Rev. G. Williams, M.A., who was in the chair, corrected a statement he had made at the previous meeting, to the effect that the revival of architectural study took its rise in Cambridge, and was subsequently received in Oxford. The real facts of the case were, that the movement appears to have been simultaneous among the members of the sister universities; but the first meeting of the Oxford Architectural Society was held in February, and the first of the Camden Society in May, 1839. Mr. Franks read a paper "On Monuments," communicated by the Rev. C. Boutell, and exhibited a drawing of a decorative pavement in the chancel of Monks' Risborough Church, Bucks, an example of value in the disposition of encaustic tiles. The secretary read some notes on the churches of St. Peter and St. Giles, Cambridge, illustrated with drawings.

PROJECTED WORKS, &c.—Tenders have been called for by advertisement for maintaining the permanent way and works of the Maryport and Carlisle Railway, for three or five years; for pulling down the old county jail at Aylesbury, and assorting and stacking the materials; for executing certain works at the Bedford Lunatic Asylum; and for the erection of a new church at Colnbrook, Bucks.

COMPETITION.—Designs have been advertised for a workhouse for the York Union, to accommodate 300 inmates on the six class system: premium for approved plan 30*l.*, or the usual commission, at the option of the guardians.

YORK WORKHOUSE COMPETITION.—Sir: I have applied for the particulars of this competition, and beg to inclose them for your consideration. To my inquiry, whether or no the guardians will employ the author of what *they* may deem the best design, on his satisfying *them* of his eligibility, I have received a flat evasion. So it is quite clear that the premium (30*l.*) is the entire stakes to contend for. Supposing that there may be thirty competitors, as I blush to say is not improbable, the actual sum offered for *each* design,—plans, elevations, sections, isometrical view, an *exact estimate*, carriage and expenses (worth at least, if anything, 60*l.*),—is exactly *twenty shillings sterling;* more, I take it, than any *bond-fide* architect deserves who shall condescend to compete. It is quite competent for committees to offer such terms, but it rests with *architects alone* to get up competitions on them, and consummate, if they will, their own degradation; and should you, Mr. Editor, think fit to insert this warning in THE BUILDER, let no suicidal competitor complain of the York workhouse competition, whatever may be the decision of the guardians.—I am, Sir, &c., A. B. C. D.

FRENCH POLISHING.—A correspondent complains bitterly of the effect of the Excise laws on this branch of trade, and urges, if exemption could be obtained for it, that it would be used extensively in lieu of paint, being cheaper and incomparably better. He continues,—"but it is not French polishing alone that is suffering from these laws; the cabinet trade, the spirit varnish trade, and, above all, the manufacture of paper-hangings, as the French are enabled to employ designers and use numberless blocks, producing a washable paper that is not to be equalled in this country. Our excise restricts us in every quarter." India rubber is about to be employed as a vehicle for colours, and is said to have advantageous qualities in that respect.

ANCIENT CHURCH DECORATION.—In the process of cleaning St. Peter's Church, Chester, some remains of what is vulgarly called "fresco work" have been discovered. They are on the surface of one of the pillars near the south door, against which is now placed the font, and on which is an ancient niche, that was appropriated probably to a figure of the Saviour, and the holy water. The paintings surrounded the niche. The grooves in the pillar are painted vermilion, and the subjects are faintly described. According to the *Chester Courant*, that on the right of the font is the Annunciation, as the shepherds, sheep, and the angel are in tolerable preservation; on the left is a city, and above an angel, the subject only conjectural. It is proposed to restore them.

EUSTON-SQUARE BATHS AND WASHHOUSES.—A recent report states, that since the opening of the establishment in August, 1846, up to the present period, 131,568 males and 14,377 females have bathed, and that the present average of women and their families, provided with clean linen, by means of their washing, drying, and mangling, and getting up the same, is 4,000 weekly, or nearly 40,000 articles of clothing.

DECORATION OF DRURY-LANE THEATRE.—Tasteful Mr. Fred. Gye has once more been to work, and in an incredibly short space of time has revived the decoration of Drury-lane Theatre, fitted up the pit, introduced a proscenium, and decorated all the lobbies and approaches. The new curtain, white and blue drapery, with a central medallion, is beautiful.

MR. JOSEPH KAY, a respected member of the architectural profession, died at his house in Gower-street, Bedford-square, on the 7th inst., at the advanced age of seventy-two. Mr. Kay held the appointments of architect to Greenwich Hospital and the Foundling Hospital.

PLAIN ENOUGH, ONE WOULD HAVE THOUGHT TO EVEN A PLAIN UNDERSTANDING.—Mr. Haywood, one of the sanitary reporters on the state of Sheffield, narrates a case which may give some idea to what extent noxious matters, such as the draining of a privy into a dwelling, are regarded by many of the humbler classes.—"Do you not perceive an unpleasant smell from that place behind your house?"—"No, nowt as I know on."—"What! does not that wet which runs down your wall smell bad sometimes?"—"Sometimes; It does a bit, of a mornin', but *nowt to mean aught.*"—"Have you lived here long?" "About sixteen years."—"Pretty good health since you came?"—"Pretty middling, considering."—"What family have you had?"—"O've had fourteen childer."—"Have they had pretty good health as well as yourself?"—"Nay, *o've buried 'em all but three.*"—"Were they all born in this house?"—"No, four were born in Derbyshire—*three of these are still living, but the youngest on 'em died here!*"

TO CORRESPONDENTS.

"*Inquirer.*"—We have no information as to the Worcester Asylum competition.

"*Inquirer.*"—There are no fixed rules.

"*F. H.*"—We know of no other Asphalte Company.

"*Pawnbrokers' Alms-houses' Competition.*"—We will give particulars next week.

"*P. P. P.*"—The referees give certificates of qualification at fixed periods, advertised in THE BUILDER.

"*J. H. R.*"—We might deceive by replying: the shape, size, and position of the ground must be considered. Get professional assistance.

"*Eleaser.*"—Look to the Act of Parliament.

Received.—"C. E." "J. W." (next week), "Amateur" (shall appear), "G. R." "J. C." "C. B." (not in our province), "M. N." "A Subscriber." "H. C." "J. A." "M. and K." "Mr. T." (Parliament-street). Thanks. "D." (Bath). "The Tradesman's Book of Ornamental Designs," Part 7. Orr, Paternoster-row. "Tait's Magazine."

"*J. L.*" (Lille).—Thanks for the sketches: we shall make some use of them. Our old friend shall hear from us soon.

"*Books, Prices, and Addresses.*"—We have not time to point out books or find addresses.

ADVERTISEMENTS.

HEALTH OF TOWNS.

KIRRAGE'S PATENT SEWER-DRAIN AND BUILDING BLOCK.—The Patentee, observing the evils which arise from the perishable nature of the materials in general use for building Sewers, Foundations, and other Works, much exposed to the action of water, was induced to attempt the production of a material which should at the same time be impervious to and indestructible by damp, and unaffected by atmospheric influences, and combine great strength and durability with facility of moulding into any required shape. In this he has been successful; and he is now enabled to offer to the Public his Patent Blocks, which will be found to possess all the qualities of great strength, indestructibility by water, facility of working, and great cheapness, and be invaluable for all subaqueous and subterraneous structures, more especially for forming the bottom of Sewers, which at present, from the nature of the materials used in building them, not only permits very considerable leakage, but constantly require repair. The use of the Patentee's material is not confined to the purposes above-mentioned, but may be applied for all building purposes, especially Floorings of Barns, Granaries, Malthouses, and other places where there is a tendency to damp and dryness is essential, as also for the formation of Baths, Cisterns, and Reservoirs.

For common Building purposes, the material of which the Patent Blocks are composed may be used as a coating for Concrete Blocks, formed of a cheaper substance.

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The material for sewerage of the shape and size herein given of the Holborn and Finsbury districts, cost at 6 inches in thickness 10*s.* per foot; if reduced to 3 inches in thickness, 5*s.* per foot; and 1*s.* 6*d.* per foot for the Barrel, or small drain of 9 inches in diameter.

Contractors, Engineers, Surveyors, Builders and Public Companies carrying on Public Works, are invited to inspect the Patent Sewer and Drainage Blocks; Drawings and Specifications of which can be seen at the offices of Messrs. DREW and SHADWELL, 22, Abingdon-street, Westminster, where also all applications for Licenses are requested to be made.

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